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ABSTRACT

Papers presented on engineering education in Britain and on the continent include: the changing pattern of engineering education (W.E. Buckley); preparation for industry (N. Herbert); developments in craft education: city and guilds courses (J. Cushing); developments in craft education: sub-technician level course (J. Longden); beyond Haslegrave (the Haslegrave Committee on technician courses and examinations) (W.A.G. Easton); engineering education in the Netherlands (A.J.W. Rommes); some aspects of the Swedish experience (G.E. Wheeler); introduction to project A, on the transition from school to employment; introduction to project B, on recruitment, selection, and development of teaching staff (J. Latham); and introduction to project C, on the consideration of the Haslegrave Committee's report (W.E. Buckley). (MSE)

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The Organisation of Engineering Education

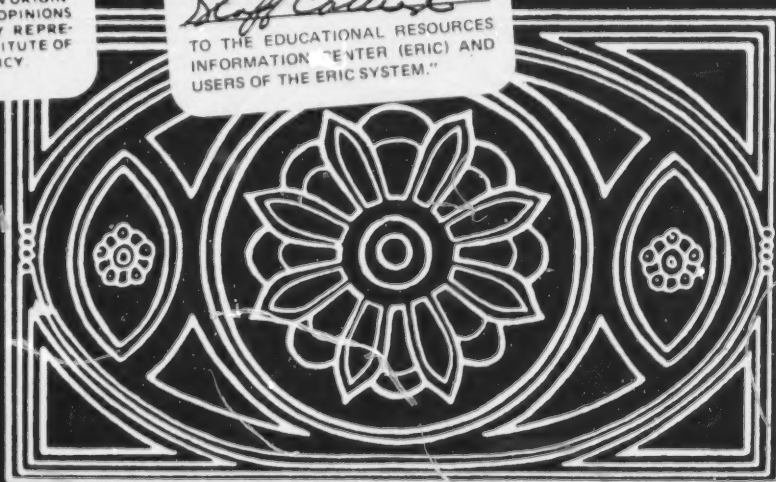
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Study Conference 74/3.

CONTENTS

Foreword	2
The Changing Pattern of Engineering Education	3
W E Buckley,	Principal, Warrington Technical College.
Preparation for Industry	8
N Herbert,	Sector Manager, Yorkshire & Humberside, Engineering Industry Training Board.
Developments in Craft Education - City and Guilds Courses	15
J Cushing,	City and Guilds of London Institute.
Developments in Craft Education - Sub-Technician Level Course	24
J Longden,	Principal, Keighley Technical College.
Beyond Haslegrave	29
W A G Easton,	Principal, Southgate Technical College.
Engineering Education in the Netherlands	34
A J W Rommes,	Co-ordinating Inspector for Secondary Technical Education, Ministry of Education and Sciences, Netherlands.
Some Aspects of the Swedish Experience	41
G E Wheeler,	Deputy Director, Coombe Lodge.
Introduction to Project A	48
Introduction to Project B	50
J Latcham,	Staff Tutor, Coombe Lodge.
Introduction to Project C	56
W E Buckley,	Principal, Warrington Technical College.
Participants	62
Bibliography	63

FOREWORD

Senior staff of FE institutions, together with a representative from an examining body and an industrial training officer met at Coombe Lodge in January to re-examine the problems of engineering departments in colleges of FE in the light of recent alterations in educational policy and changes in the future needs of the industry. The conference directed its attention to the lower skills level since a conference was to be held later in the year, in June, to consider developments in technician education.

Mr. W.E. Buckley, who acted as visiting tutor for the week, opened the conference with a review of the changing pattern of engineering education. Mr. N. Herbert, a Sector Manager in the Engineering Industry Training Board gave his views on the preparation which young people entering the industry should receive. Developments in craft education at sub-technician level were examined by Mr. J. Longden and Mr. J. Cushing described CGLI courses at this level. Mr. W.A.G. Easton, a member of the Technician Education Council, described the Council's development. Two contributions were given on engineering education abroad: Mr. A.J.W. Rommes spoke of the system of technician and vocational education in the Netherlands, and Mr. G. Wheeler described developments in Sweden.

Projects involved a consideration of the possibilities of providing full-time vocationally-biased courses designed to bridge the gap between school and industry, the problems of staff recruitment, selection and development, and a review of TEC's consultative document on Sector and Programme Committees. TEC was sent a summary of the conclusions reached by members of the conference.

- early years "Let me begin by setting the scene as it existed 25 years ago in further education, or 'technical education' as we would probably have called it in those days. The engineering departments of that time concentrated largely on mechanical engineering, with possibly a minority interest in electrical engineering, probably involving power or distribution, and a slightly less than respectable reference to production engineering. The department would probably have been offering courses for the London University External B.Sc in engineering, the HNC in mechanical engineering plus endorsements that led to the qualification of M.I.Mech.E, the rather more rare HNC in electrical engineering with endorsements that led to the M.I.E.E., the ONC in mechanical engineering, the ONC in electrical engineering, City and Guilds Machine Shop Engineering, a number of specialised craft courses, pre-technical courses, pre-senior courses, and possibly one or two pre-apprenticeship full-time courses. The staff would probably have comprised the Head of Department, one or two senior assistants and the remainder of the staff who were simply called 'assistants'.
- the present Since that time the colleges have passed through various stages of tiering: we have had regional, area and local colleges, we have polytechnics, we have colleges of FE divided into group A and group B according to their instruments and articles of government. The B.Sc in Engineering is disappearing or being replaced by CNAAT type courses. The HNC, where it exists, has changed status. There has been a substantial reduction in numbers following ONC and HNC courses. There has been a growth in technician courses, and craft style courses have been developed at such academic levels that virtually every apprentice should be capable of achieving success. Electrical and electronic work has been developed in its own right and production engineering has become established.
- landmarks The landmarks in the development of engineering education are probably far too numerous to catalogue, but I would like to refer to a few:-
- 1) The Government White Paper, 'Technical Education', published in 1956. This is often regarded as initiating the chain of events.
 - 2) The Crowther Report 'Fifteen to Eighteen', published in 1959. We are still talking about this group, although because of recent events we have changed the age range to sixteen to nineteen. Many of the questions raised in the Crowther Report still need answering today.
 - 3) The Albemarle Report, 1960, "The Youth Service in England and Wales" had a bearing on events.
 - 4) The 1961 Government White Paper, "Better Opportunities in Technical Education" was an important landmark for the engineering sector of further education, as it in effect identified a new category of worker: the technician.

- 5) The Newsom Report, 1963, while of greater interest to the schools, spoke of the type of school leaver entering the FE sector.
- 6) The Robbins Report, 1963 on higher education.
- 7) The Henniker-Heaton Report, 1964 on day release. This report said there must be a massive drive to enable young people to have part-time education, yet there are less getting day release in 1974 than there were ten years ago.
- 8) The Industrial Training Act 1964.
- 9) The 1966 Government White Paper, "A Plan for Polytechnics and other Colleges".
- 10) The Plowden Report, 1967, on children in primary schools, which has a bearing on the products of those schools who we in FE have to deal with at a later stage.
- 11) The Haslegrave Report on technician education, 1969, and the Scottish Hudson report on the same subject.
- 12) The consultative document, "Training for the Future," produced in 1972 by the Department of Employment which was becoming more involved in the area to which we are referring. This led to the 1973 Employment and Training Act, which will affect FE.
- 13) "The Development of Higher Education in the Non-university Sector", 1973, a review of future provision of higher education, its impact on colleges of education, polytechnics and colleges of FE.

The reorganisation of local government is affecting the FE system and, the reorganisation of secondary education influences our provision of courses. The FE system will inevitably be affected by the recent cuts in the rate support grant for 1974/75 and the massive cut-back in national and local government spending announced by the Chancellor of the Exchequer in December 1973.

the future

We have to look again at the engineering scene. I have referred to some historic aspects - it may well be that these seem to be part of the dim and distant past. Whether these are viewed as something which relive only in the memory or as something which now taken account of in planning, attention must be paid to the recent cut-backs in enrolments for engineering courses. We must look carefully at the causes of these decreasing numbers for they may provide an indication of where our changed thinking must lead us.

The first factor we must recognise is that the engineering industry's manpower requirements are changing. The changes can be seen as resulting from the Industrial Training Act and the new thinking which has emerged from it. The Act led to a trend towards the identification of labour and its training needs and an identification of tasks. The effect of this was seen in the levy grant policy of the Industrial Training Boards, the Engineering ITB in particular. For example, I was a founder member of the Engineering ITB in 1964 and when we began to survey the engineering industry, probably the best organised industry in the country for training, we discovered that there was only an intuitive thinking about what the size of the labour force was. The Ministry of Labour could not tell us the total size of the manpower employed in engineering, but could only give us a categorisation of manpower in companies employing five people or more. In 1964 there was an intuitive belief that there was an

annual intake into apprenticeships of about 40,000. By the time the first proper count was taken in 1966 the figure was authoritatively quoted as 36,000. The Board then began to develop policies which would lead to the provision of off the job training and therefore undertook research to identify the size of the problem. Figures show that there are at present about 28,000 training places for first year off the job craft and technician trainees - a long way short of the original 40,000 envisaged. In fact last year these places were under-filled and this year they are severely underfilled. There is no official figure yet, but this year's intake is likely to be only 16,000 as against 22,000 reported for 1972. Therefore one of the reasons why colleges are experiencing a drop in enrolments in engineering courses is that fewer people are entering the engineering industry, particularly in the official category of apprentice.

Why are there fewer apprentices? One reason is that there has been clearer thinking in companies. The labour intensive nature of engineering has caused the industry to re-examine its manpower problems and we have seen a progressive reduction over the last eight years in the total size of the labour force employed in engineering. This is partly the result of developing technology leading to increased production in terms of output per man employed. In any contracting situation the employees already within the industry are likely to remain there so a great change in the numbers employed can only be brought about by a severe cut back in the replenishment rate to the pool.

A second reason for the contraction of support for courses is the period of apprenticeship. Apprenticeships cannot start below the age of 16 because of the raising of the school leaving age (this is in any case in accordance with union agreements) and generally completed by the age of 20. It is quite common for skilled rates to be payable at the age of 20 subject to a minimum of three years training. Therefore, I personally believe that the unions are moving towards a three year training with 19 being the age at which skilled rates become payable. This contrasts greatly with the four, five and even six year period of part-time education in the technical college which apprentices underwent in the past.

Enrolments are also affected by the sophisticated and highly specialised manufacturing techniques now being used in industry. The question is raised, therefore, of whether we need to continue to provide the broad-based craft type course. We must be willing to examine these issues, and respond to the new situation.

The conference, as I see it, has three main elements: we shall examine technician education, a rather specialised field which is now taking a very positive shape due to the work of TEC. Secondly, we shall be referring to European experiences. Thirdly, some attention will be paid to the subject of craftsmen and craft education.

responsibility
for training

There are two important elements within the field of craft education: The first is industry's responsibility for training. Since the industrial revolution British industry has seen a need to provide skills training for its workers.

At first it was necessary because the public education system of the time provided only a general education - sometimes very limited. Therefore industry was forced to provide the extra training necessary. This is the historical base of the persisting belief that it is industry's responsibility to train. However under the 1973 Employment and Training Act tremendous changes are potentially available. The Act legitimises the Training Opportunities Scheme (TOPS) and therefore the DES and the DE have to examine ways of ensuring a better liaison. It is evident from figures which have been quoted following a recent joint meeting of the Departments that the financial resources which the government envisages devoting to the TOPS scheme will outstrip the amount of money which it has been quoted will be made available through the Act for the support of Industrial Training Board's activities. It has been said the the ITBs will get about £40 million - two or three times this amount of public expenditure is likely to be spent on building up the TOPS scheme.

Under the new Act industry retains its responsibility for training. It states that industries must be willing to identify their trained manpower needs and to finance the training, whether it is on an agency basis using colleges or other industrial centres or by doing it themselves. However, the Act then states that if industry, measured nationally, does not produce sufficient trained personnel or produces it at a wrong time for the national interest, then the Training Services Agency will be responsible for redress in this balance. It is possible that companies might be tempted to reduce their training efforts, knowing that the government's response will be to make up the deficit in provision. If this attitude were to prevail I think there could be a complete reversal of the tradition that industry is responsible for training and that general education alone is the government's responsibility. We would then be approaching the situation which has existed in Europe for some time, namely that government sees itself responsible, to some degree at least, for the provision of an adequately trained and educated labour force to meet the needs of industry. Any examination of the courses which will be needed over the next decade or so in engineering departments must include careful consideration of what changes would arise if there were a growth of public commitment to the provision of training.

At present the TOPS Scheme emphasises the provision of training for the individual. If an individual is unemployed and can be given a better employment opportunity by following a course then the Department of Employment will seek to make an appropriate course available to him. Furthermore, if a person is already employed and feels his talents are not being used sufficiently he is eligible under the scheme to resign from his job and receive a grant while taking a training course. I pose these points because I think we shall have to examine the extent to which individual companies will wish to continue to provide their own training. I am sure that a large number will see their training need as specifically identified with their own organisation and feel that can do it best themselves and wish to continue to provide training. On the other hand independent or semi-independent training establishments which cater for the training needs of employees of different firms are developing. In view of these developments I suggest that it would not be incompatible with the needs

FIGURE 1:

<u>CHARACTERISTICS OF FIRMS</u>		
SMALL	MEDIUM	LARGE
VARIED MANPOWER STRUCTURE		FAIRLY COMMON MANPOWER STRUCTURE
INFORMAL MANAGEMENT	SOME HAVE MAINLY SMALL FIRM CHARACTERISTICS	MORE FORMAL METHODS OF MANAGING
LITTLE FORWARD PLANNING	OTHERS ARE MORE LIKE LARGE FIRMS	HAVE BUSINESS PLANS
INTERMITTENT TRAINING NEED		CAN HAVE TRAINING PLAN
CANNOT TRAIN ADEQUATELY WITH OWN RESOURCES	MANY NEED OUTSIDE HELP WITH TRAINING	CAN PROVIDE THEIR OWN TRAINING RESOURCES
GRANT NOT LEVY MAIN INFLUENCE		LEVY AVOIDANCE MAIN INFLUENCE

of training will end. We aim to concentrate on key items. These relate to the need to plan training and development activities which match business needs, the need to pay particular attention to the categories of managers and supervisors within the context of staff development schemes and the need to secure craft technician and technologist skills which go beyond any single firm's immediate needs and match the requirements of the industry as a whole. Finally there is a need to concentrate on systems of training relating to the employee category of operator and clerical personnel. To achieve this the Board will make selective use of its resources. The areas we will concentrate on are the advisory services, the need to assist the development of group training schemes to meet the requirements of small companies, the provision of direct training where there is no proficient provision by other bodies, research and development, within the concept of programmed budgeting in order that we may use our resources effectively.

The aims of the advisory service within the new type of scheme are to assist the industry to identify training needs to secure key skills to meet company requirements as well as the needs of the industry as a whole and to operate efficiently with continuing improvement. The new scheme of levy/exemption grant emphasises the need to assist companies to identify their particular needs rather than stressing the requirements of the industry as a whole, as was the case previously. Possibly the new concept is that if every firm identifies and fulfils its needs relating to business performance the needs of industry as a whole would be met.

The requirements for improved business performance are likely to be perceived within a framework which stems from a consideration of the business plans of an organisation, i. e. its aims and objectives. Having determined these, it is possible to envisage what is required in terms of the manpower resource in order to achieve those aims. From evidence of the manpower resource it should be possible to determine what is needed in terms of training activities. This new scheme emphasises the planning of training activities, which is not required under the Board's former arrangements.

In order to achieve exemption from levy, companies must satisfy certain criteria. With regard to planning, there must be a written short and medium term training plan. Hence we expect companies to be considering their training needs for a twelve month period. There should be adequate allocation of management responsibility and accountability so that the training actions included in the plan can be fulfilled. There should be sufficient training expertise and resources available for the training plan to be completed. In considering the broad area of managers, supervisors and administrative staff we believe that there is a need to identify the job requirements and to have an objective means of measuring job performance in order that training needs may be identified to determine the training required. We feel that all forms of training by the company should generally be in accord with EITB recommendations. Companies seeking levy exemption must maintain adequate records and give access for their examination by our training advisers.

sources of further education	Various institutions are involved in the training of people employed in the engineering industry. The management centres provide management training, while supervisors and administrative staff can be provided for by the colleges of FE. With regard to transferable skills, the professional engineers and business professional trainees are likely to follow courses in the universities and polytechnics. Technician engineers, technicians and craft trainees courses are provided by colleges of FE who also provide, in some instances, education for operators and clerks.
sources of recruitment	Clerical trainees operators, craft trainees and some technician engineers and technicians are likely to be recruited from schools, although some potential technician engineers and technicians may already be employed in the industry. Higher levels of transferable skills, i. e. business professional trainees are likely to be recruited from the universities and polytechnics, and professional engineers will probably come either from within the industry or from universities. Managers, supervisors and administrative staff are usually recruited from within the industry.
systematic training	A systematic approach to training is of benefit to every category of manpower. Such an approach would begin with induction and safety training, where appropriate, followed by basic, general training and finally providing for specific and objective training requirements. The identification of these requirements is accomplished by analysing each particular situation. Perhaps the responsibility for skills training, e. g. training in manual tasks, lies with industry, while the "knowledge" element should be acquired in educational institutions, although there is certain to be an area of overlap.
the needs of industry	The identification of the needs of industry is based upon business aims related to the manpower resources associated with the achievement of those aims. Industry will probably specify the output expected from its work force, and in the future, these may stem from the consideration of the manpower resource in terms of the training plan. The output required may change, due to a growth situation for example, or, conversely, as a result of a decline in the industry. These factors would affect the numbers employed and therefore the input situation. There may also be output changes arising from changes in technology resulting in alterations in the activity or process carried out in order to produce the manufactured article. Such changes demand the restructuring of the manpower force because the input must match the output. There might, for example, have to be a special recruitment policy introduced for a particular type of craftsman. Training will be needed so that people can acquire new skills in order to achieve the new outputs required. Therefore we expect companies' plans to show in terms of numbers of employees and skills expected, the inputs necessary to meet the expected outputs. They should also allow in their recruitment policy for possible wastage which might occur during the training periods.

It should be possible, in considering transferable skills, to identify the particular skills and areas of knowledge required by the industry as a whole in each manpower category. An example of this process is that which led to the development of the systematic module system of training for craftsmen which arose from the identification of the skills needed by the industry. Similar work is being undertaken to see what approach would best meet the needs of industry with regard to technicians, and a "module system" may result. For operators an analysis of particular skills and knowledge requirements is also necessary, although in this case it is probably best done at a company level.

recruitment

If a systematic approach based on analysis is adopted in order to discover what the requirements of companies are, steps must then be taken to ensure that whatever needs are discovered, these are met. In the areas of operators, craftsmen and technicians, the manpower requirements will probably be fulfilled by a direct intake from school leavers. If school leavers are to be a major source of manpower, a proper recruitment scheme must be put into effect. We must ask ourselves what school leavers know about industry; what they understand by the term industry; what they know about the engineering industry in particular; what they know about any particular company.

career guidance

We must examine the career guidance given to pupils, and decide whether it could be improved. The school careers master is responsible for much of the guidance the students receive. How competent is he to understand the complexities not only of individual companies but of the industry as a whole? Perhaps the careers master should be supplied with better information about the industry. We must also consider the careers guidance given to students who have left school and are attending a college of FE. Various supportive authorities exist which can proffer guidance and knowledge about particular areas of the industry, for example, the Engineering Employers Federation. Guidance can also be given by particular companies. This will probably take the form of information about particular jobs and will relate jobs to careers. A company which looks systematically at its resources and is aware of its future needs will undoubtedly be able to attract school leavers on training courses to reach particular jobs or achieve particular careers. Most of the larger organisations operate such a scheme which allows for progression in careers through equipping a school leaver to work through a succession of jobs with increasing responsibility. This type of scheme is undoubtedly attractive to the school leaver. It is also possible to establish career patterns which are determined not only by the kind of work which an individual is engaged in but also the kinds of benefits he receives such as a salary progression. Small firms are often unable to provide the training or the variety of work necessary to offer such a career development plan. Therefore they may need to take part in group schemes in order to prevent themselves being more restrictive than larger organisations.

transition

Having identified the requirements of the industry and the sources of careers information which are available we must consider the best form for the

transition period from school to industry. There might be a need to give some assistance to allay the sharpness of this transition, perhaps by operating a link scheme associated not only with the switch from school to college but with college to industry and school to industry. If pupils are to be given the opportunity to sample the college environment and the industrial environment how best can this be achieved? Schools have for some years offered works visits so pupils are given the opportunity to visit various companies in their area. However these usually give the opportunity only to study only the product and processes of the company and not the job opportunities available in the organisation. Limitations also occur in visits by school parties to colleges. On these supervised tours the knowledge which the school leaver obtains of the industry may be of a rather superficial nature.

There are ways to make the "sampling" process more realistic. Some schools arrange secondment to industry or colleges, so that pupils can get a better idea of the working arrangements of particular companies or educational environments. Perhaps the career guidance given to the student by school or college staff would be improved if they were seconded into industry. Secondment has been practised in many areas, but it is usually for only a week or two which is too brief a time to experience the real working situation. Perhaps a more structured, permanent scheme of integration for pupils would have better results. Many experiments have been successfully carried out. In Glasgow for example some years ago industry did not regard the Junior Secondary sector as a viable source for recruitment. An investigation was carried out to see what job opportunities might be available if some kind of preliminary training activity could take place within the school. The Schools Craft Certificate was evolved with a standard equivalent to the first year of the Mechanical Engineering Craft Practice Course. Within the school the scheme was related to the academic curriculum with an element of vocational training. This work was also related to the home environment, for example, in electrical wiring the exercises performed by the pupils were associated with the wiring up of lamp sockets and switches. This scheme had a dramatic success and many students who would previously not have been considered suitable were able to enter the industry.

the future

There seems to be no doubt that in the course of time most of our large companies will become exempt from levy and that there will be less money available to support particular industrial training actions. Companies will have to regard training as an investment and may therefore question more closely the type of arrangements they will be providing. I believe the module system of training will remain, but companies will be examining the output in terms of the investment they put into training, especially in cases where training takes place outside the company itself. "

Discussion Arising

careers guidance

A member suggested that careers guidance would be done more effectively by the Training Board than the various bodies at present involved. Mr. Herbert agreed that the Board had a role to play here, a role of which it was very conscious. It took part in careers conventions and conferences and helped cement relationships between industry and the education sector. However, public relations work was a costly process and it was not always clear who should pay for it. Furthermore, the guidance required would have to be appropriate for each individual case. As the Board was not an employment agency, it could not provide all the careers guidance necessary, but it could certainly help.

leaving age

Mr. Herbert was asked his opinion of the tendency for pupils to stay on at school after 16 to do non-vocational courses. He said that in view of the manpower shortage it did not seem right to encourage the less bright pupils to stay on at school only to become "A" level failures. It would be better both for the individuals and for industry if they left earlier. A member suggested that the proposals for colleges to run courses for 16 year olds intending to enter industry might be an effective compromise. Mr. Herbert commented that small industries would probably welcome such a scheme but larger ones might be sceptical about whether it reflected the pressures of an industrial environment sufficiently. However, in his opinion it would be possible to create these pressures in a training situation even if it did not take place in an industrial environment.

craft training

In view of the short term pressures on individual companies it was mooted by a member that there should be increased government participation to make up the short-fall and cater for the needs of the industry as a whole. Broadly based courses might be provided outside the company which could then be "topped up" to meet the needs of particular organisations. Mr. Herbert thought that it would be quite possible for the first year off the job training of craftsmen, which is broad based, to be performed in a college or other educational institution. He felt, however, that more specific training in the subsequent years which related to particular jobs in industry would have to remain the responsibility of industry.

"I propose to speak - briefly - about some of the problems which face the education service as a result of variations in the amounts of industrial training received by craft students. I am particularly interested, of course, in the Basic Engineering Craft Studies course because this was designed for students who received the full 24-week off-the-job training course prescribed by the EITB and other training boards.

When the craft studies series of courses was introduced it was intended that the then existing craft practice courses should be phased out. This is taking longer than had been expected, however, and in the current year many colleges are running craft practice courses. The Electrical Craft Practice Course has been discontinued, but the Mechanical, Fabrication and Welding courses have been extended several times.

student numbers

In 1968/69 the EITB reported 24% of first-year craft trainees qualifying for grant being given day or block release but not full-time training. A 1971 survey by City and Guilds covered about 24,000 first year engineering craft students on Course 500 and the craft practice courses it was intended to replace. This survey showed that in mechanical courses 23.7% in electrical 35% and in fabrication and welding courses 50.7%, of students in colleges did not receive the full 24 weeks. (I hope I will be forgiven if I abbreviate my references to such students and follow the survey reports in calling students who receive the full helping of 24 weeks off-the-job training 'T' students and those not receiving it 'NT'. This is a convenient shorthand, and it tends to simplify the situation).

The overall figure, then, for NT students in the first year was 30%. This agrees fairly well with the EITB's figures because the figure for students whose employers were in scope to EITB was 25%. This overall proportion concealed very wide differences between courses and between regions and even colleges. The breakdown between courses was as follows:

	CRAFT STUDIES	CRAFT PRACTICE	TOTALS
MECHANICAL	1435(39%)	2404(61%)	3939 (100%)
ELECTRICAL	571(56%)	447(44%)	1018 (100%)
FABRICATION & WELDING	742(34%)	1447(66%)	2189 (100%)

Some indication of the variation by region may be given by an overall breakdown:

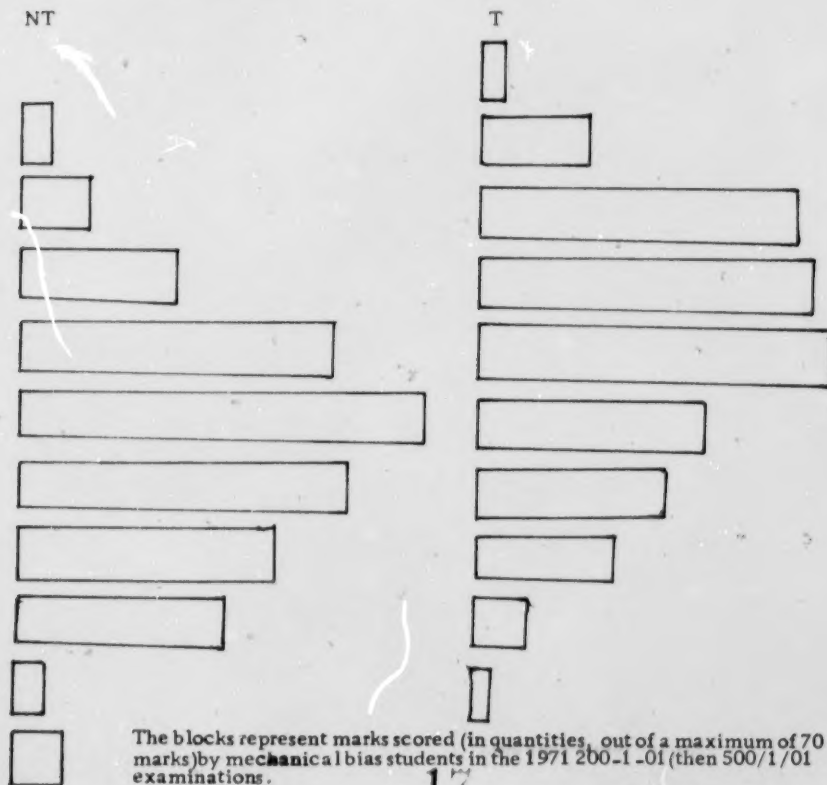
REGION	%FIRST-YEAR STUDENTS NT
N. Ireland	42
London	37
W. Midlands	36
E. Anglia	33
Yorkshire	31
Wales	30
Southern	29
Northern	28
E. Midlands	27
North-Western	24
Scotland	16
South-Western	14

problems of
NT students

These figures relate to training, of course, and only indirectly affect the further education service. In the 1971 survey colleges were asked whether they thought NT students presented an educational problem. In general they did think so, but agreement there was not complete. Analysis of examination results in the Basic Engineering Craft Studies examination by T and NT students revealed that the latter tended to do less well than the former - a typical comparison (for the mechanical bias students) is shown below.

FIGURE 1

200-1-01



You can see that there is a difference in performance, and one of my colleagues, who is more mathematically inclined than I am, assures me that it is statistically significant. Furthermore a similar diagram for the mechanics I paper would show that the difference is greater for this paper than it is for 200-1-01. The examination for the Basic Engineering Craft Studies course is divided into two papers, of which one (in this case 200-1-03) is more tied to practical applications in the craft concerned than the other, which tends to be slightly more general. Although there are considerable differences in performance for 200-1-01 (the general paper), the contrast is even greater in the applied paper. This suggests that we are not simply seeing the results of small firms with poor training schemes recruiting from the bottom end of the labour market: I am sure that this factor must have some effect, but the figures suggest that we are also seeing a difference in performance even where there is equal ability.

Now, one might suggest that these differences merely show that the examination measures training as well as education. But if we assume that differences in examination performance do show the existence of an educational problem the obvious follow-up is to say 'Yes, but if we are to improve matters, we must know why there are these differences'. There are a variety of explanations which may be true or untrue - but what the true situation is, the colleges are in a much better position to say than I am. All that can be said at this point is that colleges require time in order to teach, and presumably, more time in order to teach more; and if one thinks of the scale of the 24-(or 48-) week off-the-job course it seems quite an undertaking for colleges to try to compensate for its absence even if the loss is only consequential.

The problem of NT students can therefore be looked at basically as one of time as well as one of information. And, of course, there are three main lines of possible solution to the problem presented by NT students:

- 1) Continue the craft practice courses (using time in a different way).
- 2) Modify the craft study courses in such a way as to reduce the disadvantage suffered by NT students - this can be described as a 'single-scheme' approach.
- 3) Provide a different course, neither BECS nor the craft practice courses. Since the BECS would not be discontinued, this would necessarily be a 'dual-scheme' approach.

On the first solution there is considerable disagreement: I have heard, as I am sure we all have, spirited arguments put forward on both sides, and I do not feel that I have anything of value to contribute to this discussion. As with other possible solutions, it seems important that we do not regard ourselves as bound either to continue all the craft practice courses or discontinue all of them; or to continue them in their present form or not at all. In fact, the Electrical Craft Practice Course has already been discontinued; but this does not mean that there may not be situations - perhaps in welding - where a modified form of craft practice course should be retained.

The third line of solution I propose to leave to Principal Longden, whose paper follows and with whom I could not hope to compete in any case. I think it is worth emphasising, however, that solutions 2 and 3 are not necessarily mutually exclusive. In some circumstances a 'single-scheme approach' (ie. relying on the BECS alone) may be best, whilst in others a 'dual-scheme approach' would be better - ie. using the craft studies course for some students and a separate course for others. It is clear that however the problem of students receiving inadequate practical experience is defined there will always be a margin of colleges with some such students in any particular craft, but not enough to make up a class. Such colleges cannot profit by a specially-designed course. It is also possible that the very wide range of training backgrounds concealed in the expression 'NT' may mean that there will be a band of NT students for whom the BECS remains more suitable than the specially-designed course. On the other hand, in some areas the NT proportions are so large that there are bound to be colleges where complete classes can be made up, and it is inevitable that such colleges will at least consider the possibility that a completely different course might be the best way of satisfying their needs. We seem to arrive at three basic criteria for action:

criteria for action

- 1) The existing provision for T students through the BECS course should not be disturbed.
- 2) There must be provision for NT students which is useable by colleges with small numbers of NT students
- 3) There may possibly be a case for special provision for colleges with viable numbers of NT students.

On point 3, of course, it must be remembered that a terminal date has been put on the craft practice courses, and that if these courses are in fact abandoned the students must go somewhere; and (more positively) we might hope that a new course could attract into further education people who have (for one reason or another) not been attracted by either craft practice or craft studies courses in the past.

single scheme approach

The first two criteria concern the single-scheme approach, with which I want to deal. Any approach to NT students within the BECS courses, as I said earlier, involves different teaching or more teaching. There are a variety of possible approaches, and I have divided them into 'pure' single-scheme approaches and what I have no alternative but to call 'impure' approaches.

- 1) 'PURE' SINGLE-SCHEME APPROACHES
 - a) Extended Part I to two years.
 - b) More careful course organisation in Part I.
 - c) Three-year course.
- 2) 'IMPURE' SINGLE-SCHEME APPROACHES
 - d) Practical work additional to 240 hours
 - e) 'Narrowing' the Part I course.

What I mean by 'pure' is that the scheme maintains the full breadth of the BECS syllabus for all students, so that T and NT students follow the same timetable. 'Impure' approaches involve separate timetable provision for NT students.

The first possibility in the 'pure' category is obviously to extend the Part I course to two years (I am not going to discuss full-time courses, because these will be discussed fully at other times during the conference). There is little doubt that colleges running a 480 hour course will have at least the opportunity of countering any disadvantage suffered by NT students, so the criteria for this solution are purely administrative and political - ie. will they let you do it? That is not my province.

Also, to lengthen Part I immediately raises the problem of what to do with Part II, and makes it almost certain that Part III will be weakened or have to be abandoned.

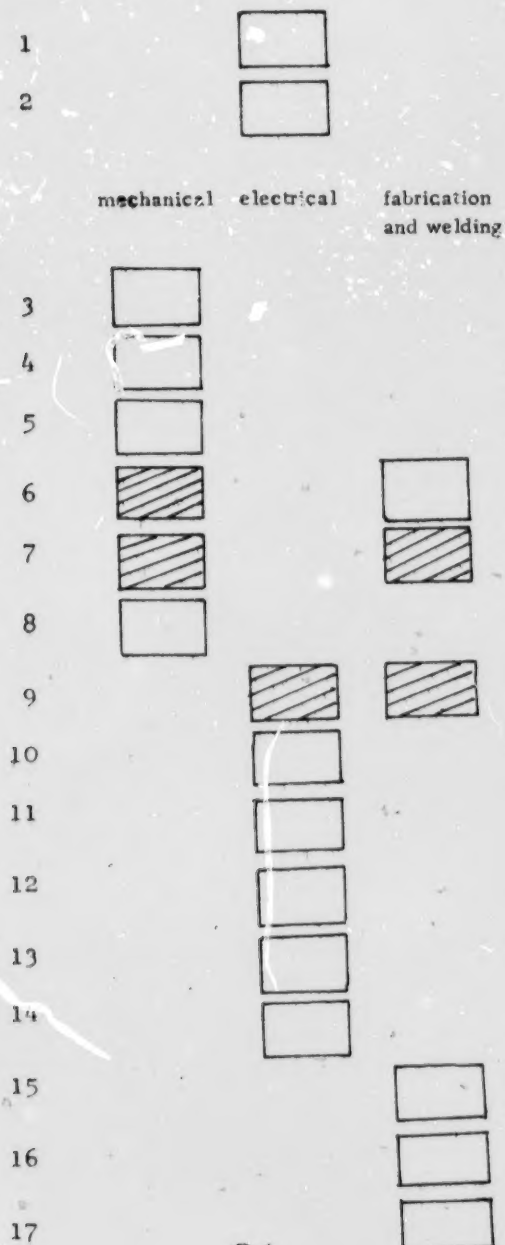
Earlier discussions (in 1972) of the possibility of lengthening Part I led to the abandonment of the idea, because it seemed absurd to set up a scheme from which 70% of students - those receiving full-time off-the-job training - would have to be exempted. It may be that the situation has changed enough to make this consideration less conclusive. If so, a considerable amount of work will have to be done on designing the parts of the curriculum which would be included in addition to the present syllabuses; and possibly on redesigning the examination as well.

The second possibility is exemplified by Scotland. Here the assumption is made that with really careful organisation of the course and associated investigational work the disadvantage suffered by NT students is not significant. To put it in an undoubtedly over-simplified way, you save time by dividing your crafts for as much of the time as possible and taking every opportunity of ensuring that the student (T or NT) is being taught only material appropriate to his craft. At Part I this is said by the Scots to be sufficient; at Part II special attention has to be paid to the investigational work undertaken by individual NT students. But all students in any craft follow the same syllabus: the secret lies in separating, not T from NT, but mechanical from electrical and electrical from fabrication and welding.

The third possibility is exciting, but not, as far as I know, much used. The regulations for the BECS permit colleges to by-pass the Part I examination and run a three-year course ending in Part II. If this is done I am assured that significant savings can be made by eliminating the overlap between Part I and Part II syllabuses and avoiding the inevitable loss of time associated with the Part I examination.

Turning to 'impure' approaches, we have first of all the device of providing extra time for NT students, during which additional practical work is undertaken. A minority of colleges are providing this, but the 1971 survey did not produce conclusive evidence as to its success. Again, it is difficult to believe that additional time will not be beneficial if efficiently used, but will they let you do it?

FIGURE II



I am of course making no attempt to go into detail, but as a purely diagrammatic representation this gives some idea how a 'narrowing' approach might work. The blocks represent approximately 30 hours each, and therefore eight of them constitute a Part I course. The shaded blocks are areas which might possibly be omitted for NT students. These could then be replaced by special provision, which would presumably be some kind of educational practical work. The course then splits down into 60 hours (25%) common for all students and 180 hours divided by craft. Of the 180 hours during which each craft would have to be taught separately, mechanical and the fabrication and welding class NT students would be taught separately from T students for 60 hours and electrical NT students for only 30.

examinations

There is no time to go any further into the nature of the problem and possible solutions, but I would like to say something about the situation as regards examinations. I work for City and Guilds, and therefore it is this aspect which interests me most; but what I say is my own personal opinion and not that of my employers. The final decision as to what policies the various examination boards will adopt will be made only after extensive discussion and consultation, in which you are likely to play a far more important part than I am. But, of course, the situation presents obvious difficulties, and opportunities, from the examining point of view, and equally obviously City and Guilds, like other boards, is actively considering ways in which the examination provision might have to be modified.

Taking the single-scheme approach only, therefore, several criteria for successful examining can be identified, not all of which are met by the present pattern. The examination might have to

- 1) be capable of being adopted at short notice;
- 2) provide for differences between teaching of NT and T students where 'impure' approaches are used;
- 3) make provision for investigational work;
- 4) allow for a 3-year course and still include the award of a Part I Certificate;
- 5) provide continuous diagnostic facilities; and
- 6) whatever it was, it would not have to use up too much teaching time.

Firstly, the single-scheme approach is for colleges which have mixed entries with small numbers of NT students in at least one of the crafts involved. It is very unlikely that colleges will be able to obtain much notice of the exact composition of their classes; so any provision which involves extensive permission-seeking procedures before the class can be started will not do. This criterion involves examination boards, but it also involves other bodies.

Secondly, if it is accepted that T and NT students do not follow the same course, the examination and certification may have to be modified to reflect this. At present if a college adopted the 'narrowing' approach, its NT students would be at an obvious disadvantage when they took the examination.

Thirdly, it might be an advantage if the examination procedure took account of investigational work. I have deliberately steered clear of this topic partly because I believe Principal Longden will deal with it and partly because the use of teaching

approaches which involve individual students pursuing separate individual curricula for part of the time is such an obvious procedure in these circumstances (whichever approach you adopt) that it needs no comment from me.

Fourthly, if the three-year course is adopted by colleges I feel that they will probably demand that some way be found of awarding a Part I certificate even though the students did not take the examination as it is set up at present.

Fifthly, because NT students cover such a vast range of different industrial backgrounds it becomes even more necessary for the teacher to have constant feedback from each student, so that if he hits a weak 'patch' immediate corrective action can be taken. I myself believe that while interpreting the results of tests which his students have taken is an inescapable part of a teacher's job, providing such tests is not.

And finally, as always with examining, the whole process must not reduce the number of hours available for teaching, whatever pattern is finally adopted. Neither of these is a new idea, but in the form in which we are at present using them they meet some of the requirements I have just listed.

Firstly, we are developing the use of a series of short tests instead of an end-of-course examination. The syllabus for a course is first broken down into blocks rather after the manner I described in connection with the 'narrowing' of Course 200. Colleges can teach the blocks in any order they like, although of course the logic of the subject matter will only allow a limited amount of variation. Each block is tested separately, and the college decides the date on which the test is set. The tests are marked by the college, and each test can be discussed with students afterwards, the answer sheets being then sent to City and Guilds for remarking, in order to provide us with question analysis data. When a student has been successful in the required tests a Part I Certificate (or Part II Certificate) is issued.

You will see that this technique does meet some of the criteria I listed. As it is available 'off the shelf', it can be adopted without, as far as the examination board is concerned, any special introductory procedure. Any minority of students can be catered for if this is thought desirable by the replacement of one or more tests in the standard scheme. A college wishing to 'mix' Part I and Part II material can do so by rearranging blocks. And the provision for discussion with classes after each test means that the system provides the lecturer with immediate feedback. In terms of time, the tests take up a total of four hours in Part I and five hours in Part II.

The second device we are working on consists of a series of short practical exercises or 'assignments'. These are designed to take about two hours of workshop time each, the aim being the rather difficult one of combining teaching and examining. The work is supervised by the lecturer, who uses it freely as a teaching situation - that is to say he offers guidance and suggests ways out of difficulties, whilst avoiding actually getting students to carry out routines they do not understand: exactly what one would do in a normal teaching

situation, in fact. The assignments are marked by the lecturer in accordance with a standard marking scheme, and the marks sent in to City and Guilds to form part of the examination result at the end of the course.

Clearly, the assignments have all the advantages of the in-course tests, and could in fact be combined with them to make one system. Because they are produced centrally they are economical of lecturers' preparation time, and because they do not change from year to year the necessary equipment can be prepared well in advance and re-used year after year.

Although, of course, common standards cannot possibly be maintained with the degree of precision attained by externally-set objective tests, nevertheless assignments do have a degree of national validity which is an advantage in any examination result."

"I intend to speak of sub-technician level education. Training and further education is frequently provided for people working at higher levels in the engineering industry - the technicians, technical engineers and technologists - but at the sub-technician level, further education is frequently ignored, despite the large number of workers who fall into this category. It is true that training in multi-transferable skills is offered to those at the upper end of the sub-technician field, aimed at equipping a worker during his initial training years for the work he will do for the rest of his life - the traditional apprenticeship. But the strength of the apprenticeship scheme has been weakening for some time. Below the level of workers with multi-transferable skills there is another identifiable group, the operatives, but these workers are not solely fitted for engineering. They are really process workers and could work equally effectively in other industries.

sub-technician
education

Between these two groups there is a spectrum of workers with various degrees of ability - those at the top approximating to craftsmen and those at the bottom having slightly more ability than operators. Most of the people in this group have more than one skill, although they cannot be termed 'craftsmen' in the full sense. I believe that we need to provide a special course to meet the particular needs of these workers. The craft studies course, I think it would be fair to suggest, is intended for the group of people at the next level; those with multi-transferable skills. Moreover, I believe that different courses are not necessarily required for workers in different fields of engineering. Courses with a common core and additional subjects to be taken by different groups of students can become complex, and if not properly understood by industry may lack support. In order for the craft studies course to meet the needs of the workers in question, it would have to be modified to an unnecessarily complicated degree. In Yorkshire we feel that the craft studies course should remain unchanged and cater only for the workers with multi-transferable skills, and that another course should be set up at a different level. We also believe that the provision of such a course would secure recruitment in colleges over a number of years of students who would provide the personnel needed by industry. DES statistics show that the recruitment of part time day students for non-advanced City and Guilds Courses had dropped from 103,083 in 1968 to 91,836 in 1970. This is partly the result of a decline in the engineering industry but I believe it is due also to the fact that people are doing work that in the opinion of the employers no longer qualifies them for the courses that exist. Yet they might be willing to consider sending them on courses if any suitable ones were offered. Statistics published in the Ministry of Labour Gazette show that in the field of mechanical engineering there are turners, fitters and skilled machine operators whose trades are very similar to those of workers in other metal manufacturing industries. The statistics show

that there are a number of fields of industry in which there are substantial numbers of workers who require study in subjects that we have hitherto regarded as the province of people in ordinary engineering manufacture such as turning and milling. We tend to recruit very few workers from outside the field of general productive engineering, but perhaps we should look to this area of recruitment. There has been an annual 2% decline between 1966 and 1972 in the proportion of people in skilled trades receiving apprenticeship training and, although it is not possible to be precise about 1973 figures, the trend seems to be continuing with another 2% decline. Yet if a course were offered which were acceptable to industry for the workers just below the category of multi-transferable skills it might be possible to revitalise the day release system, which appears to be declining in terms of recruitment, and serve a useful purpose to the industry, for there seems to be an increasing number of workers who do not receive any form of further education after leaving school. There is an increasingly large area in the engineering industry which is not being served by the FE system because FE is not offering the courses industry requires for the workers of the 1980s. New types of courses are needed.

mechanical trade principles course

With this group of workers in mind, a pilot scheme is being run by the Yorkshire Council for FE. This course, entitled 'Mechanical Trade Principles' is designed for people either preparing for or following any of a wide range of mechanical based trades. It is intended to provide instruction in the principles embodied in these trades, an understanding of which is essential if good workmanship, job satisfaction and adaptability to change are to be obtained.

The curriculum is framed so as to enable workers of varying degrees of specialism to benefit from the course. It allows a useful qualification to be obtained if the length of attendance is one year or more, the value of the qualification and the experience increasing as the length of attendance is increased. The length of attendance can therefore be chosen to suit the type of job and the limits of ability of the worker, and those who have initially achieved a minor qualification can improve it by further attendance. This has the advantage that employers do not have to commit themselves sending workers on a course lasting several years before they know how well they will cope with the course.

The course is presented and managed in co-operation with industry to meet the demands of specific groups of students, rather than the students being selected to fit a fixed course form and content. It is conducted in a practical manner since most students will accept practical and graphic learning processes and are likely to reject abstract and academic methods. The syllabus structure allows instruction to be aligned with the particular industrial conditions in which the student works without leading to undue specialisation in the college and consequent breaking of student groups into uneconomic class units. This also ensures close co-operation between college and firm to make the course meaningful to the student and significant to the employer. Therefore the course consists of a firm 'basic concept' element which develops general understanding and adaptability rather than a concentration on specific skills. The 'realism' element and industrial link is achieved through group projects. Therefore there are two types of adaptability built into the course: adaptability of course length and the versatility of the project work which follows units of

basic information and is linked to job conditions. The depth of treatment of the projects can be varied according to the prospects of the group being instructed.

The general structure of the course is shown in Figure 1. The age scale has no significance except to show that the course can align with normal youth development. The course would be acceptable, however, for those in training or re-training at any age.

FIGURE 1 COURSE STRUCTURE

Age

21

20

Supplementary Subjects Specialisation

19

Grinding & abrasive Process	Edge Tool Processes	Presswork	Welding and Fabrication	Steel Making	Food Processing (or Textiles)	Maintenance Practice	Works Services	Supervision?
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Third Year Secondary Division

18

Machining Production	Non-Machining Production	Process Industry	Maintenance
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Secondary Year Primary Division

17

Production	Services
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16

First Year Basic Course

15

Pre-FE Expectations

The process of learning up to the end of any year is complete in itself. As students proceed through the course, it is suggested that they need only divide into broad industrial categories up to the third year so that the need for separate groups is minimised. These broad divisions allow topics of general relevance to be included in the syllabus whilst leaving the more direct link with the occupation to be obtained through project work. The practical work, although closely linked to a firm's processes, is the exemplification of a particular basic concept and the linking of information to achieve understanding, rather than the perfection of a particular skill. These are factors of personal development of wider consequence than can be obtained in most skills training processes and distinguishing the course as an educational process.

The subject syllabuses do not define a group of skills forming the content of the course. Each one describes a quantity of basic information likely to be needed in whole or in part whatever the combination of skills involved in the student's occupation. This information is interpreted by project work so it will make sense to the student in his occupation. In order for such a scheme to succeed, special teaching techniques are required. A particular syllabus section is headed by a basic concept requiring a short lecture to delineate that area of study and its purpose. The relevant technical information and supporting studies are given to the group by various group instructional processes: demonstrations, operational outlines which are particular tasks performed by the individual to consolidate group instruction or to impart information, and group projects.

In the pilot schemes we have a group of 12 students and a group of eight students. Of these, half would not have been thought capable of following an existing course or the former craft practice course, but are coping well - proof, I would suggest, of the need to provide another sub-technician level course."

Discussion Arising

transfer

Would there be an opportunity for a student to transfer to a City and Guilds 200 series level course after following the mechanical trade principles course?

Mr. Longdon replied that transfer would be feasible. He felt the mechanical trades principles course would be a better option for the worker above operator level than the higher operator course proposed by City and Guilds. He feared that the latter might result in a plethora of courses in thin strata, and that if higher ability people were sent on ordinary operator courses the course might cease to cater adequately for the others.

appraisal

Asked to describe the system of appraisal to be used in the course, Mr. Longden briefly explained that it would have to be one which would cause least disturbance to the student ie. there would be continuous assessment. There might also be a short written examination, or an oral test in which local industrialists might participate. Whatever means were used, testing would be part of the normal teaching process so the student would not fear it, nor the teacher resent it as an additional burden.

"The Haslegrave Committee, set up in 1967, produced its report in 1969. Among its recommendations were the setting up of the Technician Education Council and the Business Education Council. Following the Report there was a period in which nothing seemed to happen until February 1973 when TEC's members were selected. Many of the Haslegrave recommendations will be put into effect by the Council, although of course we are not bound by the Report. Our task, as the Secretary of State, Mrs. Margaret Thatcher told Parliament in March 1973 when she officially announced the setting up of TEC, is to plan, administer and keep under review the development of a unified national system of courses, establish standards of performance and award certificates and diplomas as appropriate. We are concerned with all schemes of technician education. We have therefore to take over all Joint Committees courses, ie, ONCs, ONDs, HNCs and HNDs, all City and Guilds courses at technician level and their associated examining bodies. Therefore we have to be involved with 28 national joint committees each at present working individually. We have already taken over four of these. TEC's administrative work is being carried out by former City and Guilds staff because we shall be taking over about 40% of City and Guilds work.

TEC has 24 members; some like myself, come from technical colleges; others are Chief Education Officers, industrialists, local authority members and ITB representatives. There was some criticism that the membership does not include a 'shop floor' teacher and the only member with any ATTI activity at a national level is myself. The original membership has now slightly changed. Three members have left and among newcomers is a principal lecturer.

One of the first steps TEC took was to divide the Council into an educational working party and a resources and organisation working party. One of the first tasks was to appoint a Chief Officer, who took up appointment in September, 1973. For over three months the Council was working without any officials other than those from the DES and from City and Guilds. Therefore it was difficult for us to acquire other than basic statistics, and we spent the initial three month period discussing at length the problems TEC faced.

student numbers

We found that according to 1971 statistics, the latest available, the number of students attending existing Joint Committee technician courses in the general field of engineering was about 43,000. There were about 16,000 on building and construction courses, and about 32,000 on other areas of work. This makes a total of about 93,000 students taking Joint Committee National Certificates and Diplomas, spread over the 28 Joint Committees. They were

following 70 different schemes of work and about 2,000 individual courses. There were a total of approximately 145,000 students following parallel City and Guilds schemes in 4,700 individual courses. Therefore TEC is concerned with a quarter of a million students. This is a vast number for a single body to deal with; CNAAB for example deals with only 30,000 students. TEC's task is to unify these 6,500 courses and 270 different schemes of work into a single system.

creating a unified scheme

Difficulties will occur in overcoming the differences in courses. The National Certificate type of course is an individual college scheme, with each college working out its own plans within broad guide-lines and then seeking approval of the course from the Joint Committee. City and Guilds schemes have in the past tended to be decided externally, although there have been recent developments of 'mode three' types of courses where the colleges have been given opportunities to develop their own schemes of work. TEC will have to decide whether to retain this traditional type of approach or be more liberal. I think it is likely that we shall decide to give the colleges power to devise their own schemes within the broad guide-lines laid down by the Council.

In order to help in the difficult task of gathering together the whole range of courses we split into two further working parties, one dealing with engineering education and the other with non-engineering education. From these working parties the concept of sector committees and programme committees evolved. Although the aim is for each of three sector committees to deal with different fields of education, there are naturally areas of overlap and it can be difficult to decide which committee should deal with a particular subject.

modular structure

Having formed the sector and programme committees we then considered the broad concepts of what we were trying to achieve. For each of the City and Guilds schemes of work a team of specialists devised a specialist syllabus. In many cases each of the component subjects of one scheme differ hardly at all from those of other schemes, except in their application. Yet the students on different schemes are almost invariably taught separately although there may be only two or three items in the whole course peculiar to their particular technology. In future we shall abandon the idea that every course is unique and adopt a more modular approach to courses. Therefore in each sector the first of each of the programme committees is a general programme committee for the area of work for which it is responsible. These general committees deal with the 'common core' subjects, the subjects which will meet the needs of several types of student.

The concept of 'common core' subjects which can be taken by students following several different programmes has been adopted which will also make it possible to meet economic requirements such as the Pilkington Committee's requirements. It seems unlikely that colleges shall in future be able to offer traditional courses with eight or ten students forming a permanent and exclusive class group.

Some difficulties have arisen over ambiguities in terminology. Therefore TEC has consciously defined exactly what it means by certain terms. The course

'unit' is the individual module. The 'course' is the collection of units which builds up into a programme. The 'programme' is the entire collection of activities which leads to certification.

consultation

As an examining body I believe that TEC is unique in asking for criticism of its proposals before making firm decisions. We are asking the opinion not only of the FE colleges but also industry, local education authorities, Industrial Training Boards, organisations representing teachers, employers, trade unions, technicians associations, the Joint Committees, City and Guilds, professional bodies, the Forces and other interested organisations. As so many bodies have an interest in education, there is a problem concerning membership of TEC's committees. There will be a large number of applications from organisations wishing to have representatives on the committees. Yet we want to keep our committees down to a reasonable size. Therefore we hope to select individuals who belong to several of these bodies and are aware of the views of more than one organisation. We shall ask each body to nominate a member to serve on the committees and shall select the people whose names are put forward by several organisations. However, they will serve as individuals, and not as representatives of the organisations to which they belong.

control

TEC's aim is to develop a system of education which will not be dictatorial but will give the colleges a fair opportunity of deciding what they wish to do. Therefore we shall set guide-lines showing what we believe each unit should consist of but it will be up to the colleges to select the appropriate units to make a course for themselves. Alternatively a group of colleges could decide between themselves what they want to offer in terms of courses on a regional basis. The latter scheme will probably appeal to smaller colleges as individually they may lack the full expertise necessary for curriculum development.

TEC may operate some form of inspection of resources before allowing a college to run a course in cases where the course is unlike any that the college has offered previously. Where colleges have experience of ONCs, ONDs and City and Guilds specialist courses there is likely to be automatic transfer to TEC courses. The DES has already indicated that in future Her Majesty's Inspectorate does not wish to be responsible for course approval. Therefore TEC will have to appoint a number of its own field officers to carry out consultation in relation to courses and where necessary examine the colleges' resources and report back to the Council's sector or programme committee on whether a course can be offered by a particular college.

finance

At present TEC is totally subsidised by the DES. Our budget for the coming year was originally almost exactly a quarter of a million pounds but has been cut by 10%. In the future we shall have to look for other sources of income

We might follow the CNAA pattern of charging a fee for application for course approval, which would prevent colleges applying to offer a course to which they are not suited on the off-chance that they will be accepted. There will of course be examination fees. These are normally charged at a rate which is sufficiently only to meet the cost of the examination process itself. TEC

will have to decide whether to charge each student a little extra in order to subsidise its other activities, or seek other sources of income.

time factor

It is no easy task to form a body such as TEC which will be responsible for a third to a quarter of a million students per year. It cannot be rushed, because once decisions have been taken, their effect will be felt for many years. Over the next two years, TEC will set the pattern for technician education for the next 40 or 50 years. Therefore it is important that we do not rush to take decisions which we might later regret. It is bound to take at least two years from the time it is first envisaged for a course to appear in a college. I believe it is unlikely that any TEC courses will begin until September 1976 or 1977. Therefore the first TEC certificates and diplomas will not be awarded until the end of the decade. There will be certain complications during the 'changeover' period when existing courses are gradually replaced by TEC courses, particularly where there is no direct parallel. There is likely to be a national changeover date for particular groups of courses, but there will be no single date when all the courses are changed. I believe that most colleges will be happy about the length of time it will take to provide TEC courses, as they will be able to plan without being under pressure. I hope that by the end of the decade TEC will be fully operational to the advantage of the colleges and not to their detriment."

Discussion Arising

relationship with
other bodies

Mr. Easton was asked to describe the relationship of TEC with other sectors of the educational system. He replied that contact with other educational bodies was made whenever necessary. At present TEC was involved in discussion with the Schools Council on the Certificate of Extended Education, because this might become one entry qualification for a TEC course. Contact would be made with all organisations which would have any impact on technical courses. In some cases this would be done through the membership of TEC, in others links would have to be formed at officer level.

certificates
and diplomas

Several members expressed their regret at the fact that unlike the Joint Committees TEC would not differentiate between modes of attendance by granting a diploma for full-time students and a certificate for part-time students. Mr. Easton replied that the Diploma had acquired greater status than the Certificate, and TEC believed that status should attach only to quality of work, not mode of attendance.

international
acceptance

Asked whether any steps were being taken to ensure that a TEC award was recognised internationally, Mr. Easton replied that it was necessary first of all to produce a scheme which was acceptable within the UK. However, discussions would take place with other European countries in the hope that TEC qualifications would achieve an international currency.

entry qualification

On the issue of entry qualifications, Mr. Easton said that there was a major difficulty in combining entry qualifications for the various courses TEC was replacing. There were no entry qualifications for City and Guilds courses, while the Joint Committees demanded four 'O' levels. TEC would probably reach a compromise solution. It would have some entry qualification, as it did not want a high wastage rate, but on the other hand TEC did not want to exclude the student who would have been able to complete a City and Guilds course without any formal entry qualification. Perhaps, for those without the necessary qualification, there could be a preliminary year to enable them to reach the required entry standard.

"Education in the Netherlands has recently undergone a turbulent period with the introduction of the new Secondary Education Act in 1968. In order to put engineering education in its proper perspective I shall describe its place in the general context of secondary education. To quote from an article I wrote in a Ministry of Education booklet¹

the new
educational
system

"The education system has a long genesis behind it. The structure has undergone numerous changes over the years. Some of the structural changes have taken place within existing institutions, and some were the result of the introduction of new types of school.² The reason for the changes is to be found in the growing need to provide education for ever-greater numbers of the Dutch population.

By tracing past developments it is possible to discern a fairly clear interaction between prosperity and education. In periods of economic boom interest and participation in education increase more sharply than in periods of economic depression. As a result, there are some breaks in the line of development. This is partly due to a lack of cohesion between the various types of school, each with its own regulations differing from those of other types of school, and often intended for specific sections of the population.

In recent decades especially, which have seen a period of increasing prosperity, ideas on the function and the structure of education have changed considerably. Education has assumed an increasingly important place in the cultural, social and economic development of the community. In no other period has participation in education increased so rapidly. So as to offer every young person an optimum chance of developing in accordance with his wishes and ability, it has been necessary to reform the education system and to adapt it to contemporary requirements.

¹ "The Kingdom of the Netherlands." Facts and Figures 32. Government Printing Office, The Hague, Holland.

² The term "school" covers institutions of higher and further education as well as primary and secondary education. (Ed.).

New Acts have been framed for nursery education, for secondary and special education, for apprenticeships and for the universities. Despite the structural changes that have been made in education in recent years it would be premature to claim that it had been consolidated. A further democratisation of education will make more structural changes necessary. "

**secondary
education**

Secondary education comprises all forms of education after primary school with the exception of special education, i. e. apprenticeships and the universities. The Secondary Education Act in 1968, which is, because of its vast subject, also known as the "Mammoth Act" divides secondary schools into four types:

- a) pre-university schools (comparable to English grammar schools)
- b) general secondary schools
- c) technical and vocational schools
- d) others

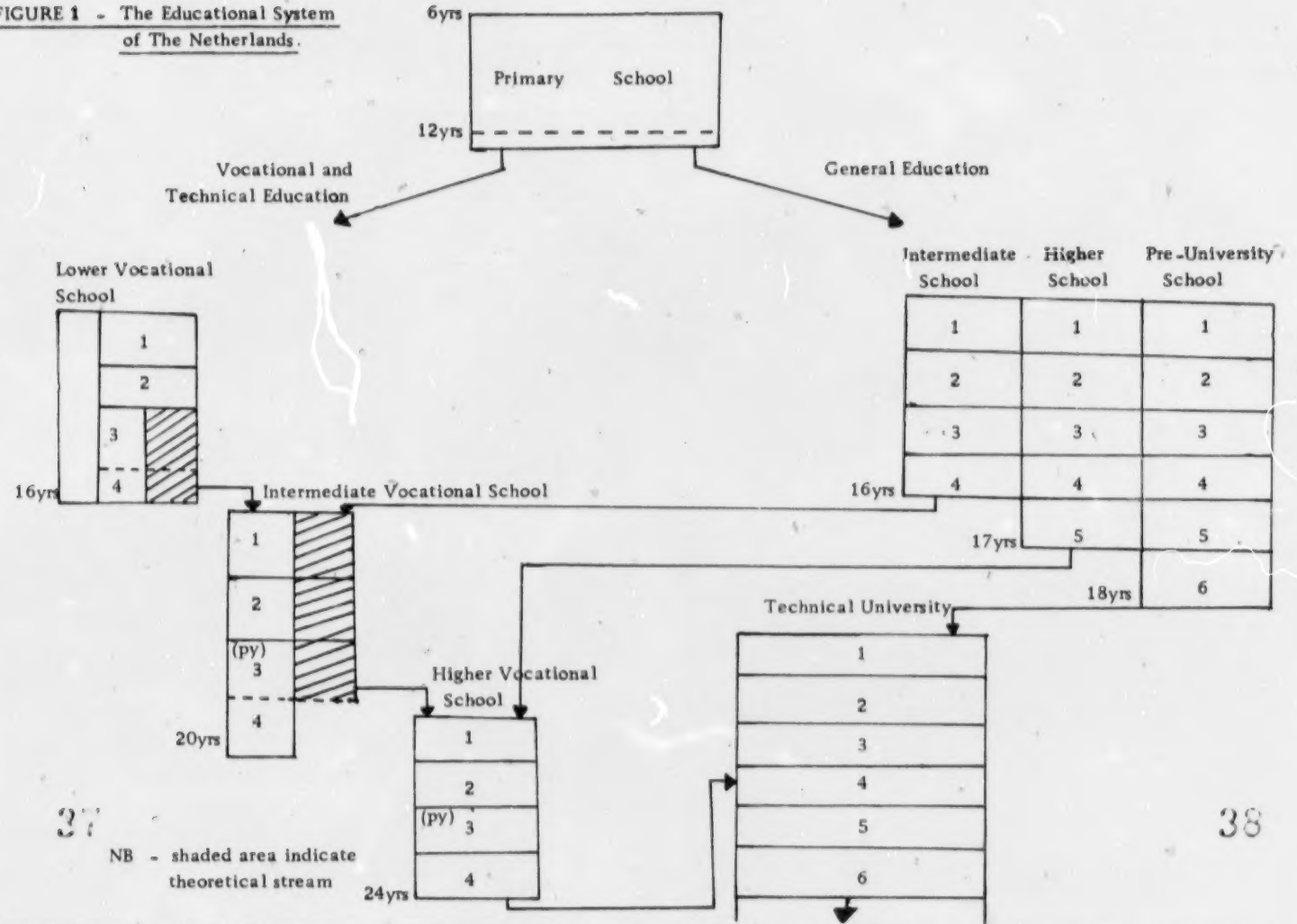
Before this Act came into force secondary education was governed by a number of different Acts. Each contained its own regulations for the type of school it referred to, which differed on several points from the regulations contained in the other Acts. These differences related to founding and running the schools, teachers' qualifications, methods of financing and examinations. In an organisational respect, therefore, it was hardly an educational system at all.

A striking feature of the new Act is that it governs both general education and technical training. It thus reflects the view that the two types are complementary to each other and form part of a whole with a common objective. This is an important development, because in the past vocational education has been regarded as less prestigious than other types of education, and now, for the first time, it is raised to an equal level. It is now possible for a youngster to attend university without having attended a school of general education, whereas before the Act, entry to university was dependent upon an academic schooling. Naturally, old prejudices will remain for a while, and parents may hesitate to send their children to a vocational school, but they will eventually come to have parity of esteem.

The diagram which illustrates the new educational system of the Netherlands (overleaf) will show that all children have a common education in their primary schools where they remain until the age of 12 years. In their final year they take a series of sophisticated tests which decide whether they should attend a pre-university, general or vocational school. The first year of secondary education is a transition year in which all schools have a common curriculum. Its purpose is to help the pupils find their bearings in their new situation, and ensure that their placement has been in the right type of school for them. However, it is rare for a child to be transferred from a vocational to a general or pre-university school, although this may occur between middle general, higher general and pre-university schools.

FIGURE 1 - The Educational System of The Netherlands.

36



37

38

A number of "scholengemeenschappen", literally, "community of schools" exist. These are mainly of a horizontal type, consisting of a combination of different types of school for the same age group. The Act has given them greater freedom in curriculum design than conventional schools, since they can extend the transition period for two or three years. Yet the number of "scholengemeenschappen" in which elementary technical and vocational schools are included is still small.

pre-university
education

At the pre-university schools courses are offered with the object of preparing pupils for university entrance. At the end of the six year course a very demanding leaving examination is taken in seven subjects, of which only one, the Dutch language, is compulsory. For the other six, the student may select from a number of options. A pass must be gained in all seven subjects in order to enter university.

general
secondary
education

The term "general education" as used here means non-academic, non-vocational schooling. There are higher general secondary schools and intermediate general secondary schools with courses of five and four years respectively. It is possible, on leaving an intermediate school to enter the fifth year of a higher school and on leaving a higher school to join the sixth year of a pre-university school but this demands very hard work from the student and occurs infrequently.

technical and
vocational
education

The term "vocational and technical education" includes many types of school: teacher training schools, technical schools, domestic science schools, agricultural schools, commercial schools, trade schools, art schools, and socio-pedagogic schools which prepare pupils for occupations such as youth work. Most of these schools are at three levels: lower, intermediate and higher. However, there are only two levels of socio-pedagogic schools: intermediate and higher. The teacher training schools are all at the higher vocational training level, with the exception of those for nursery school teachers. In some art schools the levels are less clearly defined. In general, although there is no explicit provision in this respect in the 1968 Act, vocational education follows a period of general education, and is the last stage of a pupil's full time education. Technical and vocational subjects therefore begin in a lower technical or vocational school after a two year course in general education. Admission to intermediate technical and vocational schools follows three or four years at a general intermediate school and admission to a higher vocational school requires five or six years education at a higher secondary school. A certain percentage of children qualify for the vocational school level above that of the general secondary school they have attended, and it is also possible for promising pupils to move from lower to intermediate and from intermediate to higher vocational training, and from there to university.

Lower vocational education plays an important part in the education system, since almost 50% of young people enter this type of school direct from primary school. In the past school leavers were already skilled workers, but because of the increasing stress on general education in these schools, it is

now necessary for them to follow apprenticeship schemes. The children who attend these schools are of differing abilities. Therefore as well as the usual curriculum, special individual technical education with a high percentage of practical work is provided for the pupil who cannot cope with the normal syllabus. Brighter pupils are placed in a special stream in the third and fourth years and pursue a more theoretical course than the other students. At the end of the fourth year these may go on to higher education in the intermediate vocational schools. As in all the other schools, the pupils take a final examination, which is nationally recognised. The examination is in six subjects and must include mathematics and science to qualify for entry to the intermediate vocational school.

About 16% of lower vocational school pupils and 4% - 5% of intermediate general school pupils go on to intermediate vocational schools. During the first year each group pursues a different course, so that those with a more practical background are given extra theoretical education and those with a general secondary background are introduced to practical subjects. There is a possibility that in the future the lower vocational schools and intermediate general schools might amalgamate to form a more comprehensive middle school. The length of the courses in intermediate vocational schools vary from one to four years. The intermediate/technical schools have a four year course to prepare students for a profession or a position of a technical nature in the executive, constructional, supervisory, administrative, economic or commercial field. Many reach good middle management positions and are greatly demanded by industry. The schools include departments of mechanical engineering, electrical engineering, electronics, architecture, civil engineering and chemical engineering. The third year at the intermediate technical school is a practical period, spent in industry. This is to acquaint the students with industry so that they are able to return to school in the fourth year to select the six subjects they wish to take in their final examination.

The brighter student, instead of entering industry, may stay at the school during the third year and after taking the leaving examination, again with compulsory mathematics and science, go on to the higher vocational school. All students spend about 28.5% of their time on general subjects and the rest of the course is devoted to technical subjects, partly in workshops and laboratories and partly in theoretical work.

Evening classes are held at intermediate vocational schools for students who have left school. Courses last two or three years and successful students receive a diploma. There are also a small number of schools which operate solely as evening institutions, and their students sit the same examinations as other intermediate vocational school students.

The higher vocational schools offer four year courses of a standard equivalent to that of a university (B.Sc level). They have a student intake from both intermediate vocational schools and higher general secondary schools. Their purpose is to prepare young people to take up managerial and other senior

positions in industry. As in the intermediate vocational school, in the first year there are two courses, catering for the different types of student entering the school. Then the two groups follow a common course. At the end of four years, if successful in their examinations they may go on to the University of Technology, entering it in the fourth year of the six year course.

Most of the students at the University of Technology have attended pre-university schools. They follow a three year course before they are joined by students from the higher vocational schools. At the end of the sixth year they sit for their "doctoral" which gives them the title "Engineer" or "Doctor of Engineering". At this stage they have not written a thesis, which may take another year or longer, and gives them the qualification of "Dr". Students may leave after an examination in the third or fourth year, with the equivalent of the B.Sc., but most employers hardly recognise this qualification and regard the student as having left before completing his course.

finance

Until the statutory leaving age of 15 years all education is free. After the age of 15 parents pay fees based on their income. Books have to be purchased by the pupils. The government gives a 100% grant for school buildings and staff salaries, although only a few schools are directly controlled by the Ministry of Education. The rest are private schools. This is due to the fact that religion has played a major part in Dutch history. Relationships are delicate so the allocation of funds to Roman Catholic, Protestant and non-denominational schools must be finely balanced and therefore school inspections are carried out with utmost care. There is an extremely good co-operation between industry and the technical schools.

Often schools are presented with equipment no longer of use to industry, and industrialists frequently sit on the Board of Government of these schools. Sometimes industry tries to pressurise the schools to make the pupils more specialised and therefore ready to take up a job without any further instruction from the companies employing them, but educationalists try to resist this, believing that students should not be pinned down to a particular career too early. "

Discussion Arising

equipment

Asked to describe the quality of equipment in schools, Mr. Rommes said this was very good. Each school had an equipment board which decided what was required. The request was considered by a government inspector and a national equipment board, and the equipment paid for out of public funds. A standard equipment list existed, and schools could make suggestions for additions and amendments to this. The inspectors were intended to be stimulating, rather than supervisory.

university
places

Mr. Rommes was asked to comment on the fact that not all qualified students were able to go to university because of a shortage of places. He replied that this was a case of demand outstripping supply. If students achieved a 75% pass mark in their final school examinations they were guaranteed placement. For students who passed at a lower level, a lottery took place.

religious
schools

On the question of schools of a certain denomination, Mr. Rommes said that there was no bias regarding the intake of students of a particular religion. Pupils attended the school nearest their home, whatever their religious convictions.

why Sweden?

"Developments in Swedish education, both for the 16-19 year old and at university level, offer several interesting parallels and extensions to UK experience. Approaches at institutional level are of interest to educationalists facing similar problems in Britain. As a staff college we suspected that the literature available on other educational systems often reflected a national or 'system' viewpoint which was sparse, singular and limited to the 'showplace'. Therefore we thought it would be a useful exercise to visit countries facing similar problems to our own and examine their activities at an institutional level. Sweden was selected for study because its educational system, which was previously similar to the traditional elitist European pattern, has been reconstructed along comprehensive lines. Sweden now has a plan for a comprehensive 7-16 school with very little differentiation by curriculum or ability, and a 16 plus comprehensive school which offers a variety of 'lines' or options, and which, it is anticipated, will be attended for at least two years by all pupils by 1977. At present these schools are already attended by 80% of the age group. A completely new curricula was developed for the 16-20 year olds and associated with this a concurrent programme of staff development was introduced for every member of staff in the system.

general background

Before examining the educational system and the staff development programme in depth, it may be useful to remind ourselves of the type of environment in which the educational system is set. Sweden is a large country, the fourth largest in Europe, with an area of 174,000 square miles. Much of this is uninhabited. The density of population per square mile is 46, compared with 585 in the UK. However, the severe educational problems which might arise from such low density are tempered by concentration of the population in urban areas. In 1972 80% of the population were living in urban areas. The three largest towns contained nearly one third of the total population between them. Stockholm itself has about one and a half million inhabitants with another million people living in the surrounding area.

The birth rate in Sweden is low - about 13.5 live births per thousand annually compared with 16.5 in the UK. The death rate is also low and the life expectancy is high: there are 10.4 deaths per thousand annually in Sweden compared with 11.9 in the UK; male life expectancy is 72 years (69 in the UK) and female life expectancy is 77 years (75 in the UK). This results in the proportion of people over the age of 60 years being higher than in most European countries.

For a full account of the visit to Sweden and the case studies collected by G E Wheeler and C M Turner see 'College Management - Readings and Cases' Vol.4. Coombe Lodge.

Sweden is a rich country. The GNP per capita stood at £3,873 in March 1973, compared with £1,998 in the UK. Private per capita consumption was £2,025 in Sweden compared with £1,259 in the UK. The country's wealth results from expansion in the mining, metal fabrication and timber industries which has taken place over the last century. This has led to the development of a powerful engineering industry which contributes about 45% of the GNP, and the successful international marketing of aircraft and automobiles. The high level of national prosperity has been achieved against a background of reducing weekly hours per worker - the average hours worked per week in the manufacturing industries, including overtime are 35.4 hours, compared with 45.7 hours (1969 figures) in the UK.

Suicide statistics indicate that Sweden has a higher rate of suicides than other countries in Europe. However, Sweden has a more advanced medical service than many other countries, and therefore suicide is more accurately identified. Owing to the longevity of life there is also a tendency for old people with terminal diseases to take their lives.

Some final general points worth noting are that the Socialist Democratic Party have been in power for over 40 years and there has been no war for 150 years. The most commonly spoken foreign language is English - immigrants arriving in Sweden embark upon an English course immediately - only later do they begin to learn Swedish. Even Chinese is now being taught as a second foreign language in some institutions.

education

At every level of education in Sweden there are three clear aims: the development of the community; the development of the individual; the provision of vocational training and development to ensure that the country will continue to prosper. No Swede would admit that any one of these is more important than the others.

There are nine years of compulsory schooling, from 7-16 years. In 1977 this is to be extended to 11 years, probably by making 18 the leaving age. kindergardens exist for children from one year old up to seven years of age, and although there is no obligation to attend, most children do go to this type of school at some stage. Pupils leave school at 16, but 80% - 95% of them, depending upon the geographical location, go on to the 'gymnasium'. Courses at the gymnasium usually last two to four years, although they may take up to six years. Male students may break their studies for a year to do military service, or they may do this at the end of their course. On completing their studies at the gymnasium, students may go on to university, teacher training colleges, schools of nursing or follow courses run by companies, government administrations and so on, or enter commerce or industry.

The problems of providing a further education service in Sweden where 80%-95% of 16-20 year olds enter gymnasias are of quite different dimensions from those we experienced in the UK. Clearly, there are different economic problems. There are also educational differences, because the intake includes the less able student, and students whose motivation is not so high as it would be in a less comprehensive intake.

The present education system in Sweden is fairly new. There have been two major changes and one minor alteration within the last 18 years. This means that little of the existing accommodation is purpose built and that staff over the age of 50 have had to cope with several changes. The most recent was the development of a fully comprehensive system for all age groups, replacing the existing elitist system which was divided laterally according to the pupil's intelligence, and also functionally according to the vocational bias of different schools. There were, for example, technical gymnasia and commercial gymnasia. The education of the 16-20 year old is now fully comprehensive, with a vocational emphasis.

Throughout their school career children are continually assessed and at the age of 16 they decide, with the help of their parents, the type of course they would like to follow at gymnasium level. They will already have had some supervised industrial in-company experience at school. This is made up of two separate periods financed by industry; two weeks at the age of 15 and one month at 16 years. Several courses or 'lines' are offered at the gymnasium. These are of various lengths.

The following two year lines are available; clothing manufacture, building and construction, distribution and clerical, economics, electro-technical, motor engineering, agriculture, consumer and nursing, food manufacture, processing techniques, forestry, social, technical, woodwork and nursing. Three year lines are offered in economics, liberal arts, natural sciences and social sciences, and there is a four year technical line. Supplementary one year courses are also available, for example a three year natural science course can by the addition of an extra year be turned into a technology course. These courses are provided throughout the entire Swedish system. Naturally, not every gymnasium is able to provide every course. In major cities the concept of a gymnasium is not of a single institution but perhaps three or four institutions under one Rektor. This group would be able to offer a large number of lines. The distribution of courses is manipulated by the National Board of Education of the local authority. A number of courses, such as forestry, are offered in only a few institutions.

The students' choice of course is transmitted to the local authority. Courses are matched not only with demand but also with economic need, by the National Board of Education. There is a limited number of courses in particular subjects provided in various regions of the country. The course to which the student is admitted is determined by ability, affinity and space. The number of places for popular courses often fails to match the demand and students may be allocated to their second or even third choice. Often students have to travel long distances or live away from home particularly if they live in a rural area and cannot follow the particular course they are interested in at the local gymnasia. Lodging allowances and hostels are available for these students.

The educational system is administered by local authorities and the National Board of Education which is part of central government but detached from it. In many ways the system is akin to our own. Local authorities levy local taxes

and finance part of the educational provision. However, the National Board determines courses and curricula and approves any new courses or alterations to the curricula. Courses are standardised throughout the country and once approved, cannot be altered without further approval.

credit system

No external examinations exist, but pupils take a series of nationally set assessments. These take place at least six times a year for each line, and students accumulate credits. The attainment of credits is the mark of success on any course and enables the student to go on to university. All credits collected from the age of 16 onwards are regarded as highly important. The appointment of teaching staff, for example, is based entirely on the credits the candidates possess, and there are no interviews, except for the post of Rektor (or Principal).

Several problems arise from the educational system in Sweden. These result from the high intake of young people into FE, the nationally determined curricula, the national testing scheme, the national selection of teachers and their placement within a local authority which may move them from one institution to another, and the commitment to non-streaming except in languages.

staff

The teaching staff of the gymnasia sector of Swedish education fall into two distinct groups - 'lectors' and 'adjuncts'. Lectors are more highly qualified than adjuncts, usually possessing the 'Filosofie Magister', the 'Filosofie Licentiate' and having passed a teacher training course. The Filosofie Magister qualification is obtained by gaining at least six points in university examinations in two or three subjects taught at the gymnasia. The Filosofie Licentiate qualification is gained after three years of additional studies. A doctorate is not required for the post of lector but it renders the applicant better qualified and carried with it a higher rate of pay. The adjunct must also have a degree, the 'Filosofie Kandidat', and have passed a teacher training course. Non-graduate, vocational teachers are also employed, although these are more usually found in the senior levels of the 7-16 year old schools. These teachers usually have seven years previous practical experience in the occupation concerned followed by a 33 week teacher training course.

Salaries of teaching staff are higher than in the UK, although the cost of living and taxation is also high. Lectors earn between £5,500 and £7,000 per annum, adjuncts £4,750 to £6,500, and vocational teachers £4,000 to £5,000. (1973) 'Subject leaders', i.e. heads of department, who must be of lector grade, earn an additional £400 per annum. Other tasks within the gymnasium may also be remunerated, e.g. time table preparation and supervision of teaching practice. Taxation is high; a lector earning £6,400 per year would pay £1,590 national income tax, and any additional earnings over £6,400 would be taxed at 44%. Local income tax is also payable. This is assessed on the remaining income after national tax has been paid and averages 22.5% of taxable income. A pension tax of 5% of income is also levied. The VAT rate is high - 15% - and payable on almost everything including food. Although there are many allowances e.g. for wives, children and rent above a standard norm, taxation is still heavy

and has the effect of lowering the average teacher's responsiveness to monetary incentives. Lectors therefore accept posts as subject leaders not because of the extra 1400 they will receive - this is whittled away by taxation - but because of the extra power and kudos they will have and because the post will be an additional credit which they can use for future job applications.

A teacher may have an established post, an unestablished post or a post. An established post is one in which the teacher is appointed for life; the conditions for an unestablished post correspond to those for an unestablished post in the UK Civil Service; a casual post is a temporary appointment, perhaps for a term. The security of tenure which is attached to an established post is limited to the basic teaching position. Subject leaders are usually appointed on an annual basis although some are appointed for three years; while re-appointment is usual it is not automatic. Rectors are appointed on a six year basis, as are National Board Inspectors, and although re-appointment is normal, especially for two further terms of six years, it is again not automatic. With all short term appointments, the holder is able to revert to his established teachers post when the appointment is terminated. A teacher may hold an unestablished post or a temporary post in, say a teacher training college, seek and be appointed to an established post in a school, and not take up this latter position until he so wishes, perhaps in several years time. Meanwhile, the vacancy in the school would be filled on a temporary basis. There is complete interchangeability between the education service, the local authority inspectorate and the national inspectorate, so a typical career pattern might include appointments to two or more of these services which have a common trade union. The normal retirement age is 70, although the working life of an academic is only about 40 years, because until the age of 30 he is likely to be studying and doing national service.

staff development

In order to teach a particular subject the teacher must be qualified in that subject. If a new subject is introduced, environmental engineering perhaps, any teacher who wishes to teach this must take an additional qualification, usually a university diploma, in that subject in his own time. If he fails to do so he will not be permitted to teach the new subject and will be downgraded to teach in lower level institutions where his old subject may still have a relevance. He may arrange to do part-time work, and take a corresponding salary cut, in order to have enough time to study. For example, when the global subject 'science' was introduced in the gymnasias, it was not possible for it to be taught by existing biology, physics and chemistry teachers until they had taken a new qualification in 'science'. There are about 80 differentiated qualifications which may be possessed by gymnasium teachers, covering 18 lines (or courses).

Accompanying any curricula change there is a systematised programme of staff training. In 1972 when the gymnasias were reorganised and the curricula changed, the National Board set up a team to produce a description of the new system in the form of a book, film, tapes and slides. Information was included on time-tabling, organisation, teaching, and assessment. Compulsory two or three week courses were arranged for local authority inspectors and rectors using this material. Then every teacher had to attend a five or three day course conducted by those who had been centrally trained, again using the material produced by the National Board.

Each rektor has at his disposal five days per year for staff development - days on which the pupils are on vacation. There are usually two days organised by the local authority, one day of National Board training, and two days at the disposal of the rektor himself. In addition to these staff development programmes there are subject up-dating programmes offered in vacations and in the evenings. There is competition to attend because they are creditable.

A consultancy system is an unusual aspect of staff development in Sweden. In every locality there are consultants in each subject, usually working as teachers in colleges of education, universities or gymnasia. Their role is threefold: they are available for people to contact by telephone and ask for advice; they visit colleges and give advice; they advise the local authority and National Board. Complete confidentiality is assured. The consultancy system has considerable impact upon the education service, for it means that no teacher need feel isolated.

The concept of job rotation is a popular one. Not only do staff take up appointments in the local authority and national inspectorate as a part of their normal career pattern, but attachments lasting one or two years are also frequent. It is possible for teachers who have a particular idea, for instance concerning teaching method, to be granted a sabbatical year to develop the idea, write a paper and present it to the appropriate committee of the National Board. If the National Board are enthusiastic, they might invite him to become an inspector for a year, visiting gymnasia during that period in order to circulate the idea. Then he will return to his former post, having gained additional credits for his activity. The extraction of staff from their normal posts in order to do developmental work is regarded as beneficial to both the educational system and the individual.

recommendations

Staff development in Sweden has several characteristics which could be adopted in the UK. My main recommendations would be:-

- 1) For every curriculum development scheme there should be a concurrent staff development programme.
- 2) More attention should be paid to the problem of developing staff to deal with the increasing number of students entering FE.
- 3) The process of secondment, which adds depth of experience, should be more common.
- 4) The consultancy system should be adopted.
- 5) The five day compulsory attendance at staff development courses should be introduced, as it draws the attention of teachers to problems in education.
- 6) Attendance at a national summer school, on a more widespread basis than present DES courses offer, should be encouraged. The Swedish concept of a 'pilot' should be considered. By this method a teacher who has attended a course runs seminars in his own region and thus policies and ideas can be rapidly disseminated.
- 7) The National Boards programme development committee is preparing 10 week training courses for Principals and Directors of Studies. A similar scheme should be introduced in the UK.
- 8) Local authorities have officers responsible for staffing and staff training who have sound knowledge of the techniques available for this purpose, and similar posts should be created in the UK.

- 9) There are advantages in having a single professional body comprising local government officers, national inspectors and teachers, for animosity and misunderstanding between these groups is thereby reduced. "

Discussion Arising

Industrial experience

Asked whether college lecturers had any industrial experience, Mr. Wheeler explained that in technological and commercial subjects teachers were expected to have seven years experience in a profession after obtaining their first qualification.

practical training

On the matter of practical training, Mr. Wheeler said that the technical education in Sweden was highly theoretical and during the first two years of a course in the gymnasium concentrated upon the literature, academic nature and description of the subject. There was no link with local industry, although industrial advice was given to the National Board Subject Committees. There was no attempt to mix training with education - training took place later when the student had entered industry and was more mature.

access to education

Describing the open access to education which existed in Sweden, Mr. Wheeler said that all courses were either free of charge or had low fees. While the possession of credits was necessary for people to receive a qualification at the end, university courses were open to people who simply wished to follow them without taking the credits.

PROJECT A

"To consider in the light of the changing educational pattern and changing demand from industry the problems of transition from school to employment in the engineering industry"

The conference's opening address by W. E. Buckley on the changing pattern of engineering education formed the introduction to this project. Several members presented discussion papers describing the work of their own colleges in the field of engineering education for young people. In their discussion syndicates were asked to examine in particular the problems involved in the organisation of full-time vocationally biased courses at craft level for 16 year old students.

Syndicate Reports

general problems

A number of general problems which affected transition from school to industry were identified by Syndicate 2. These were partly social: parental pressure to stay at school; the lure of employment, perhaps halfway through a course; the need to have a reasonable income. Secondly, there were problems associated with career guidance: a need for up to date advice; a need to avoid being pressurised into unsuitable courses or employment at commercialised careers conventions; the reluctance of schools to release students, a lack of advice on the relative usefulness of various courses, e. g. OND or 'A' levels, and which subjects to take; the fact that the raising of the school leaving age had reduced the time available for the craft student to make decisions under the present apprenticeship entry conditions. Finally, there were problems associated with industry: the need for help in bridging the change from school to work; the lack of time given to craft level boys to decide on options; the danger of embarking on training schemes or apprenticeships with no job at the end; the fact that whatever course is taken, a youngster's final destiny was likely to be dictated by the needs of industry.

relationships

The syndicates agreed that these problems could be eased by co-operation between schools, colleges, careers advisory services and employers. The solution to most of the problems lay, stressed Syndicate 2, in giving the student experience, information and advice. Properly devised linked and full time courses with these three factors as specific objectives would contribute to this solution.

courses

Syndicate 1 felt that whatever problems were involved, linked courses would ease the situation, enabling the student to make the right choice. They would provide the student with a foretaste of the skills involved in a wide

range of occupations, give more realism to metalwork taken at school and demonstrate the crafts and manipulative skills required for a chosen activity.

Syndicate 3 recommended a full time course of six months to a year's duration, which should be controlled by the college. EITB support would be necessary for the support of any future school/college course. Liaison committees should be formed in accordance with recent Schools Council Working Party Reports, with the membership comprising head teachers, HMIs and LEA officials. Liaison committees with industrial firms would also be essential. If the course were more than six months long there should be a possibility of the student changing his specialisation.

A similar full time course of one year's duration was proposed by Syndicate 4. It would provide a broad based general engineering course for the student who had decided on and was suitable for a career as an engineering craftsman. The course would provide a foundation for changing patterns of future employment, a pool of suitable entrants to industry and the opportunity for young people to choose a vocational education course as part of their education. Entry requirements would be some passes at CSE level in technically oriented subjects combined with success in a mechanical aptitude test. In order for it to succeed, the course would have to be fully funded to the level of finance for existing training courses with a system of awards or grants for students. It could be launched only if local industry accepted the course - otherwise there might be a risk of students being unable to find jobs afterwards.

Syndicate 2 differentiated between students who were committed to a career in engineering, and those who were uncertain. Students of "O" level ability who were committed to engineering should take ONC courses, while those who were uncertain would be advised to take "A" level courses at school while making visits to industry and colleges of FE. In the middle ability range, committed students should follow full time FE technical courses at the age of 16 and over. Uncertain students should stay at school, following FE link courses from the age of 14 and over, possibly taking CSE or, in future, CEE at the appropriate stage. For youngsters of craft ability, the syndicate felt that it would be best if those who had decided on an engineering career took a specially designed pre-apprenticeship course in an FE college at the age of 15, while those not sure about whether or not to enter the engineering industry should follow FE link sampler courses from 14 years and over.

PROJECT B

"To consider problems in the recruitment and selection of teaching staff for departments of engineering and to make recommendations for appropriate staff development programmes"

J Latcham,
Staff Tutor,
Coombe Lodge

Introduction to the Project

"In introducing the subject of staff development I would like to refer firstly to the ACFHE/APTI joint working party report on staff development published in February 1973. This stimulated discussion and was endorsed without comment by the ATTI. This seems to me to be rather surprising because of the serious practical problems which are implied in the implementation of a formal staff development programme.

I shall concentrate my remarks mainly on the problem areas which I think require a great deal of thought and work within colleges in order to create a successful staff development programme. The ACFHE/APTI document opens by reflecting that there are difficulties in a sector of the teaching profession in which 65% of the practitioners have had no professional teacher training. This is a percentage which has shifted little in spite of the quite widespread activities over the last 10 to 15 years of the technical teacher training agencies - the four colleges in England which undertake training in FE and their out-stations. The high proportion of untrained teachers therefore remains a problem, although in Scotland only about a third of FE teachers are untrained. We must remember, however in making any comparisons, that there are fewer teachers in FE in Scotland - about 5,000 altogether.

The ACFHE/APTI publication shows great concern over the lack of trained teachers and in my view this tends to over-colour discussions about staff development.

Staff development discussions have been prompted by two lines of thought. Firstly, a comparison of our management activities with industry and a consideration of the part their management processes, of which career development is an integral factor, can play in further education. Secondly, we have been prompted by the reflections of the James Committee on teacher training in general. The ACFHE/APTI paper states that where there are so many untrained people practising in a profession problems must arise. Apart from this, and the reflection that career development ought to be regarded as one of the most important ways of improving the effectiveness of FE teaching, other reasons for staff development are also advanced.

preparation
for change

The FE sector has grown in response to change - change in the social climate, change in the nature and requirements of industry, change, above all, in the types of student entering FE and the expectations of those students. Our students have passed through a system of primary education which has undergone fundamental changes over the last 20 years. Changes in primary teaching methods, which have now projected themselves into the secondary schools are bringing into FE a group of students who are not accustomed to the classic lecture type of presentation which is still a common feature in FE. Therefore there is a need to develop the curriculum and the teaching method to match the needs and expectations of the students. Our teachers should keep abreast of the changes in the industry and the changes in teaching method.

Increasingly FE has administrative problems and we therefore increasingly ask teachers to undertake administrative duties. Yet we give little training for these new responsibilities. In the natural course of promotion there is very little management development. A head of department reaches his post mainly on the basis of teaching expertise, yet there is no automatic correlation between teaching ability and administrative ability.

job
satisfaction

Another reason for staff development suggested by the document is the enhancement of job satisfaction for our teachers. One of the crucial differences in manpower management problems in education is that there are not the same opportunities for rewarding by pay and promotions as there are in industry. Many teachers are in FE simply because they believe they are doing a worthwhile job. Therefore job satisfaction is an important element in FE.

Although people have been conscious of these problems for years, discussion over the last few years has produced a consensus of opinion which believes that too little effort has been devoted to the development of our teachers - that the informal processes which have been carried out in the past have not made enough headway. This opinion has been reinforced by the reflections of the James Committee on teacher training.

limited
resources

As soon as staff development is considered more formally a new dimension, that of resources, is introduced. This presents additional problems because resources available for staff development are limited. In order to ensure the most effective utilisation of these limited resources it is necessary to formalise the process of their supervision. Inevitably there will be problems of allocating priorities. The needs of the college and the FE service as a whole may clash with the needs of individuals. There must therefore be some formal method of allocating priorities. Finally, there is a problem of basic organisation of the staff development programme.

staff
development
activities

Several catalogues have been compiled of activities which might take place in a staff development programme. The ACFHE/APTI document gives a comprehensive list: initial training; subject knowledge up-dating, training in management; research; consultancy; service on academic boards and

course committees; study leave and appraisal, the latter being one of the most difficult problems in staff development. The ACFHE/APTI document states that it is unlikely that these activities can be launched without a great deal of support in the college. Therefore the suggestion is made that there should be a staff development officer to co-ordinate and direct activities, and that he should be at the level of Principal or Vice Principal. He should be supported by a committee or working party, perhaps, of the academic board. This immediately raises a further problem - that of the relationship between this organisation for progress in staff development with the responsibilities of line management.

Turning from the issues raised in the ACFHE/APTI document, let us consider a number of specific questions with particular reference to the ways in which they affect engineering departments:

recruitment

Firstly, we might examine the problem of recruitment. Recruitment is part of the total staff development process, because the type of staff who are recruited determines the activities which have to be carried out at a later stage.

the
engineering
department

We might then turn our thoughts to the specific problems of the engineering department, and attempt to discover whether there are any areas of general concern. It may be that local situations dominate, but if there are any general problems we ought to recognise them and look for solutions. Several pertinent questions may be raised: Does the fact that most staff are untrained affect the effectiveness of the department? Does it affect the quality of the day to day teaching? Or does it affect rather more the ability of staff to deal with problems of curriculum development and pedagogic development? Do we need to make provision for the improvement of teaching skill? What opportunities are available for teachers to learn of new developments in their particular field of interest, in practical skills, in industrial applications? The need for up-dating is clearly of importance to engineering departments. What opportunities, if any, should be provided formally or informally for teachers to develop administrative skills? Do we need to provide training in counselling? In considering these questions, syndicates may discover areas of common need, or it may be that problems vary from college to college, area to area and individual to individual.

staff
development
programme

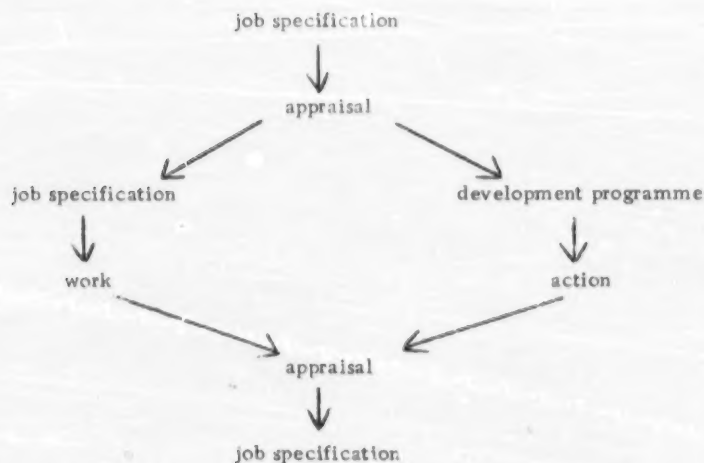
As a third consideration, the syndicates should examine the possibilities of a formal college staff development programme. Many colleges have already begun discussing such a scheme at academic board meetings, others have moved further towards setting up a staff development process. If a formal staff development programme is to be instituted, what sort of organisation should be set up? Should the Vice-Principal be responsible for staff development and chair the academic working party on staff development organisation? Many colleges find it advantageous to have a built-in facility for providing professional help, perhaps by appointing one or two lecturers in education who do some teaching but also provide help and guidance to individual teachers. If such tutors are appointed, how are they to be fitted into the college structure? Should a small education

department be set up? Should these tutors be answerable directly to the Vice-Principal? If so, how can the conflict between the responsibility of the head of department and the staff development responsibility be resolved?

appraisal

If a formal staff development programme is set up, and because of limited funds decisions have to be made concerning priorities, there must inevitably be a formal process of appraisal. It is often said that teachers would not accept any system of appraisal, but it exists in any case in an informal, unregulated and often unrecorded manner. Appraisal is implicit in judging needs. Taking an industrial appraisal model (See Figure 1) and adapting it for teaching, there should be a formally stated and formally written job specification for every teacher, which should be discussed with him. At some interval, possibly annually, he should discuss his performance during the preceding period against the job specification with someone, perhaps the head of department, perhaps the staff development officer. Problems arise over what areas should be included in the appraisal. Can the heading "teaching ability" be excluded from the appraisal? If not, how is such an appraisal to take place? At the present time there is a tradition in higher and further education that the classroom is sacrosanct. But can any organisation leave unquestioned the effectiveness of its fundamental process? Is it possible to make a fair judgement of a teacher in a classroom when the presence of a third party fundamentally disturbs the usual relationship he has with his class? Who should perform such an appraisal, the Principal, Vice-Principal, departmental head, professional tutor, or colleague? Should we consult the consumer, the student?

Figure 1.



If a lesson is appraised, what should follow? What records should be kept, who should keep them, for what purpose should they be used, and who should have access to them? All these problems arise as soon as a formal commitment is made to expanding staff development activities. How are a teacher's other activities to be appraised - his subject responsibilities, his participation in the life of the college and so on?

Once a periodic appraisal has taken place in the formal staff development process, the job specification for the ensuing period should be re-drafted and at the same time a development programme should be arranged for the individual. This programme might be internal, for example the teacher might be given the responsibility of being a course tutor, or he might be sent on a course elsewhere. After a period of time another meeting and appraisal should take place, and the job specification should again be re-drafted. Can this type of staff development programme be successfully adapted to the FE environment? Finally, syndicates might consider what preparation is necessary in a college in order for it to accept a formal staff development programme. "

Syndicate Reports

recruitment

The syndicates agreed that in order to recruit effectively, a job specification should be prepared and a description made of the qualifications and abilities required of the person to be appointed. The selection procedure should be designed to ensure that the person appointed met the specification as closely as possible. Relevant industrial experience was vital and the person appointed must be flexible in the subject range he could offer to teach, prepared to take part in administrative work in the college, teacher trained or willing to be trained and prepared to take part in a staff development programme. Syndicate 4 noted that job replacement should be carried out on a college basis rather than a departmental basis, and that the value of a probationary year should be seriously considered. Where an individual failed the probationary year, extra training should be provided and increments withheld. Syndicate 1 stressed the importance of an induction course for new staff to learn of the normal routine duties of the department.

professional (teacher) training

Most groups agreed that full time pre-service and in-service training at a college of education provided the best preparation for teaching. In-service part-time courses were an acceptable substitute. Syndicate 3 recommended that all untrained staff should attend some in-service course within the first few years of appointment and that some supervised teaching should be associated with any such course. Syndicate 4 felt, however, that untrained staff of long service should not have to undergo training if they were judged competent by an external body.

updating With regard to up-dating and preparation for change, it was recommended that time be allocated, extending if necessary to continuous periods of a week or more, to ensure that the teacher remained proficient in his teaching ability and subject knowledge. The opportunity to develop administrative skills should also be provided, although there was disagreement over the value of such courses as the Diploma in Educational Administration.

Syndicate 3 emphasised the important role the department could play in ensuring that staff had the opportunity to participate as part of their normal duties in a range of departmental activities such as curriculum development, team teaching, examination work and administrative duties. There was little agreement over who should control staff development - the Principal, Vice Principal, a committee, the departmental head, or a combination of two or more of these.

job
specification Most groups believed a job specification was vital. Syndicate 3 said that while it must exist it need not be documented as there were risks associated with too rigid a specification. In relation to teaching, the specification should state class contact hours, subject area and course level but leave room for flexibility in interpretation.

appraisal Syndicates agreed that some form of appraisal was necessary but were wary of too formal an approach. Syndicate 1 thought that objective appraisal was not practicable but that a subjective interview between the lecturer and a senior member of staff should take place when necessary and at least once a year. Syndicate 4 felt it was acceptable that a brief record of these discussions, approved by the member of staff in question, should be held by the staff development officer. Syndicate 3 however, was unwilling to approve an appraisal system which involved the recording of assessment of teaching ability and classroom performance. Instead the group suggested that personal records of qualifications, industrial and teaching experience, noting especially any extensions of activities after first appointment to a post, would provide a factual basis for appraisal. If this were supported by personal knowledge based on regular personal contact, observation and interview, decisions on individual staff development programmes would be reasonably well founded.

PROJECT C

"A consideration of the Technical Education Council's consultative document on sector and programme committees, November 1973"

W E Buckley,
Principal,
Warrington
Technical
College

Introduction to Project

"The Haslegrave Report is the base from which to start a consideration of the Technician Education Council. Its official title, "Report of the Committee on Technician Courses and Examinations" results from the National Advisory Council on Education for Industry and Commerce setting up the Haslegrave sub-committee in September 1967. Two years later the Report was published. The delay by the Secretary of State in accepting the proposed policy was considerable, due to the discussions which had to be carried on behind the scenes before such a major change in policy could be adopted. It cuts across our established pattern of control of technician courses and examinations. It interferes with established City and Guilds and Regional Examining Union practices, and with the practices of Joint Committees who represent numerous professional bodies. Therefore there was good reason for the successive delays which occurred. However, in March, 1973, the Technician Education Council was announced. Then it seemed to go into hibernation: we knew the chairman, we knew some members, but it was several months before we knew who was to be the Chief Executive.

The first document of TEC to appear in print was "Technician Education Council Preliminary Statement" published in October 1973. This listed the 24 members, representing education and industry (including trade unions), who would make up the Council. The Preliminary Statement showed that the Council had looked closely at its role and had already decided its general policy in terms of type of award. It stated that the Council had decided to award the following TEC qualifications: certificate, higher certificate, diploma and higher diploma. This was the first stage of confirmation of the general philosophy outlined in the Haslegrave Report. The preliminary statement also gave an indication of the committee structure TEC would have.

In late December TEC's consultative document on sector and programme committees was circulated to colleges for comment. In planning this conference we estimated that such a document would be issued before the conference took place, and if a consensus of opinion is arrived at in syndicate discussion, a report of our comments might be sent to TEC.

The consultative document is important, obviously, for what it says, but it is also important for what it omits. Three terms are carefully defined in the booklet: "programme", "course" and "unit". It is important to understand their precise meanings as far as TEC is concerned because they are at variance with the rather loose meanings they have had in the past. I would also draw attention to the definitions of "sector committees" and "programme committees" and their terms of reference. To quote briefly from the document (Section 3.1) sector committees are defined as

"within the framework established by the Council to advise the Council as to the area of work to be covered by the sector and to recommend any changes in its scope and to interpret Council policies for the sector including any applications of policy particularly appropriate to the sector and secure their implementation".

This implies a substantial delegated role for the sector committees. This is further developed in paragraph 3.1.4 where it states that the sector committee will

"approve on the Council's behalf the recommendations of its programme committees."

The second tier in the committee structure are programme committees, sub-units of the sector committees. Their nature is listed in various appendices to the consultative document. Each of the three sector committees will have a number of programme committees. In Sector A, which is broadly aligned with engineering, it is suggested that there will be 11 programme committees. In Sector B, which is the general area of construction, there are likely to be eight programme committees, and in the third basic field, science, which is dealt with largely by Sector C, there will probably also be eight programme committees. TEC prefers to label its three sector committees A, B and C, rather than naming them according to the field with which they will mainly deal, because it is less restricting and means that their area of influence is limited only by the programme committees which are allotted to them.

The scope of operation of TEC will be identified at the programme committee level, the lowest tier in the Council's structure, and the Council itself will be seen to be an accumulation of responsibilities that develop from programme committees operating in specified and defined areas. For example, in Sector A, programme committee A1 is a general programme committee. Its fields of activity are defined as certificate and diploma courses in general engineering subjects plus the common core content of any specialist programme. Electronics and communication engineering is dealt with by A2; electrical engineering is the scope of A3, instrument and control engineering is the field of A4, etc.

TEC recognises in the consultative document that it should have a link with BEC, the parallel body proposed by the Haslegrave Committee for business education. BEC is proving more difficult to establish than TEC because of

the more diverse nature of the professional and quasi-professional bodies which have to be consulted. TEC is therefore seeking to have a means of liaising with BEC and to identify the need for joint sector committees or for an interface between TEC sub-committees and BEC committees when these are established.

The scheme set out in the document seems to be well thought out and far reaching. However, there are several issues which are not specifically mentioned but which it seems reasonable to raise: In paragraph 3.2.3 it is stated that the programme committee will consider individual college or grouped college proposals for programmes leading to the Council's award. Later, in paragraph 3.2.7 the document says that the programme committees will hold discussions with college staff and with industry and other employers as required, including visiting colleges and other establishments. There will probably be about 500 colleges offering TEC courses, offering an average of six courses each, making a total of 30,000 courses. These will all require discussions with college staff and industry, and perhaps college visits. Therefore the first issue to be raised is the size of staff necessary to administer the system. It has been said that there might be as many as 70 full time field officers, though this is not mentioned in the consultative document.

The second question is, given the large number of colleges distributed throughout the country operating courses under the aegis of TEC, what sort of system will be instituted to ensure the maintenance of standards and to provide necessary visits to colleges? While I do not wish to be critical, it might be worth considering whether the system involved will be like the CNA system and if so, whether this would work for TEC.

Thirdly, with regard to TEC's central examining system, Haslegrave stated that the colleges would be capable, subject to certain general guidelines, of conducting their own scheme under the centralised authority of TEC. While the issue of a decentralised examination system is not raised in the consultative document, given the committee structure of TEC, there is a realistic prospect that this might develop. This, in my view, would be a welcome development, but it would require extra resources within the colleges, and therefore should be carefully considered.

The fourth issue I would like to raise is the future role, if any, of regional examining bodies and the CGLI. Will they continue to have any status and tasks in examining of technician's courses?

Fifthly, the syndicates might consider the method of financing TEC. If there are to be 27 programme committees each with 20 to 30 members meeting periodically, who pays for their expenses and the administrative organisation necessary to support the supervision of about 500 colleges operating five or six courses each? Haslegrave appealed for central funding but recognised that at least some of the development expenses would come from the only source that finances curriculum development at present,

namely via the examining bodies, and their only facility for raising funds is by charging examination fees. Is it reasonable that a substantial portion of the cost of TEC should be seen to come from the student, bearing in mind that many of the students' fees are paid by the local authorities?

The next question is that of teacher participation. At present teachers participate in planning on City and Guilds and Regional Examining Board committees, and have to rely on goodwill of other teachers to take their classes. Should there in future be a timetable allowance for the teachers involved in planning work for TEC?

A further problem caused by the setting up of TEC is the phasing out of existing activities. The difficulty is lessened by TEC's acceptance of the administrative responsibility for certain Joint Committees so that TEC will be able to decide when to introduce new activities and discontinue old ones, but the phasing out of old courses is a substantial problem, and adequate notice must be given, particularly to colleges and students, to ensure that those who are trapped in the "grey area" between courses are given adequate opportunity to complete their qualifications. "

Syndicate Reports on Project C

As a result of syndicate work on Project C the following statement, summarising the conclusions reached by the syndicates regarding the consultative document, was sent to TEC.

Study Conference 74/3

"THE ORGANISATION OF ENGINEERING EDUCATION"

1. During the week 14th - 19th January the Coombe Lodge Study Conference 74/3 was devoted to the topic - "The Organisation of Engineering Education" and was attended by 33 Heads of Department and senior teachers of engineering.

As part of its work the Conference members devoted some time to consideration of the Council's consultative document of November 1973 on Sector and Programme Committees.

2. The Conference supported the concept of Sector and Programme Committees and of the topic areas suggested in the document.
3. The Conference welcomed the prospect of college participation as described in the document. It had observations on the question of teacher participation as follows:

- (a) it supported the suggestion that one third membership of Programme Committees should be made up of practising teachers.
 - (b) it would wish to see an increase in teacher participation in Sector committees over that proposed in the document.
 - (c) it recommends that teachers invited to participate at all levels should be drawn from those currently practising in the field of technician education.
 - (d) it hopes that all parts of the country will be represented.
 - (e) it urges the council to recommend that college authorities facilitate the fullest possible participation by teachers.
4. The Conference expressed some concern on the question of the long-term financing of the Council's activities. It urged the Council to seek alternative forms of income so that fees to examination candidates did not become prohibitive.
5. The Conference gave consideration to the next stages of the Council's work and recommended early consideration of the following:
- (a) Recognition of the two types of technician activity as described in Appendix 7, paragraph 2 of the Haselgrave Report.
 - (b) The provision of facilities for transfer between the technician ladder and other parts of the education system.
 - (c) Adequate provision must be made to ensure facilities for interchange between TEC and SCOTEC.
 - (d) The provision of a role in technician education for the regional examining bodies, perhaps in meeting the needs of groups of colleges.

Other proposals put forward by the syndicates were:

1. Core subjects

It was felt that nationally devised schemes and examinations had some merit, particularly for core subjects, whereas individual modules could be college based to suit the needs of the area. Some members, however, felt that if all technicians carried out a schedule of common modules, there could be a danger of some studying certain subjects in isolation. However, there might be an advantage in combining some course studies that had a common interest.

Visiting Lecturers

J Cushing	City and Guilds of London Institute.
W A G Easton	Principal, Southgate Technical College.
N Herbert	Sector Manager, Yorkshire & Humberside, Engineering Industry Training Board.
J Longden	Principal, Keighley Technical College.
A J W Rommes	Co-ordinating Inspector for Secondary Technical Education, Ministry of Education and Sciences, Netherlands.

Conference Tutors

W E Buckley	Principal, Warrington Technical College.
B F Hallett	Visiting Fellow, Coombe Lodge.
C T Ferguson	Staff Tutor, Coombe Lodge.
J Latcham	Staff Tutor, Coombe Lodge.

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The Further Education Staff College was established on 15th November, 1960, with the principal objective of improving the efficiency of further education establishments. Since 1963 the college has been organising study conferences at which senior personnel in education, industry and government are given the opportunity of discussing and analysing developments in further education, and of making recommendations for action and enquiry.

Study conference members meet both in plenary sessions to hear and discuss lectures and in syndicates to discuss specific topics and projects. Syndicate discussion may be augmented by the employment of expert witnesses, visits to other establishments, and simulation exercises in administration and personnel management.

In 1963 the college undertook the publication of Session Papers outlining the work of conferences, and in 1967 the College Report Service was instituted to publish documents on a number of issues relating to tertiary education.

Within its Report Scheme, the Service publishes twenty Reports each year (forming one volume), which include accounts of the proceedings of selected study conferences, collections of papers and special reports. Subject matter covers the development of the objectives and instruments of further education; the inter-relationships between colleges, industry and other branches of education; specialised subject developments; college administration and management.

These Reports do not necessarily express the views either of individual conference members or of the Staff College.

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